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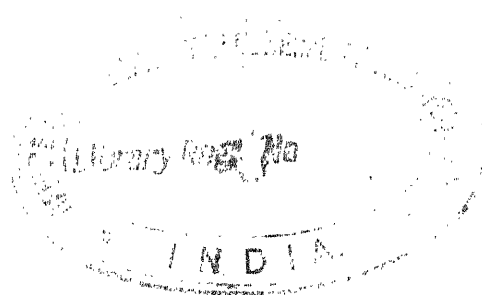
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PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY.



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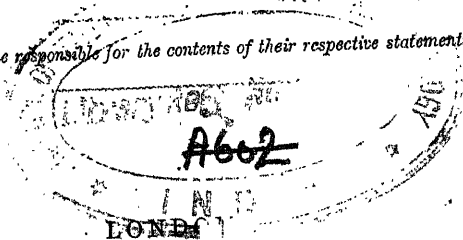
VOL. X.

SESSION 1865-6.

Nos. I. to VI.

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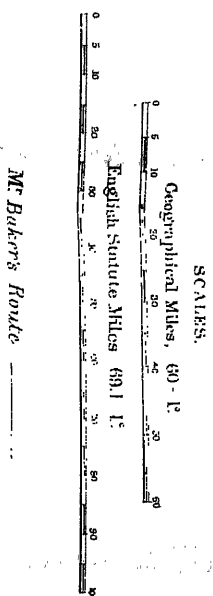
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Every packet must be sent either without a cover, or in a cover open at the ends, so as to admit of the enclosures being removed for examination. For the greater security, however, of the contents, the packet may be tied *across* with string, but must not be sealed, and should have the words "Book Post" marked in legible characters above the address, in all cases in which there is a postal arrangement for the transmission of printed matter between the two countries at reduced rates.

It is also particularly requested that all MSS. intended for publication in the Society's Transactions be written only on one side, for the convenience of printing.



A MAP OF
THE ALBERT NYANZA
AND OF THE ROUTES
LEADING TO ITS DISCOVERY
IN 1864.
BY SAMUEL WHITE BAKER, ESQ.



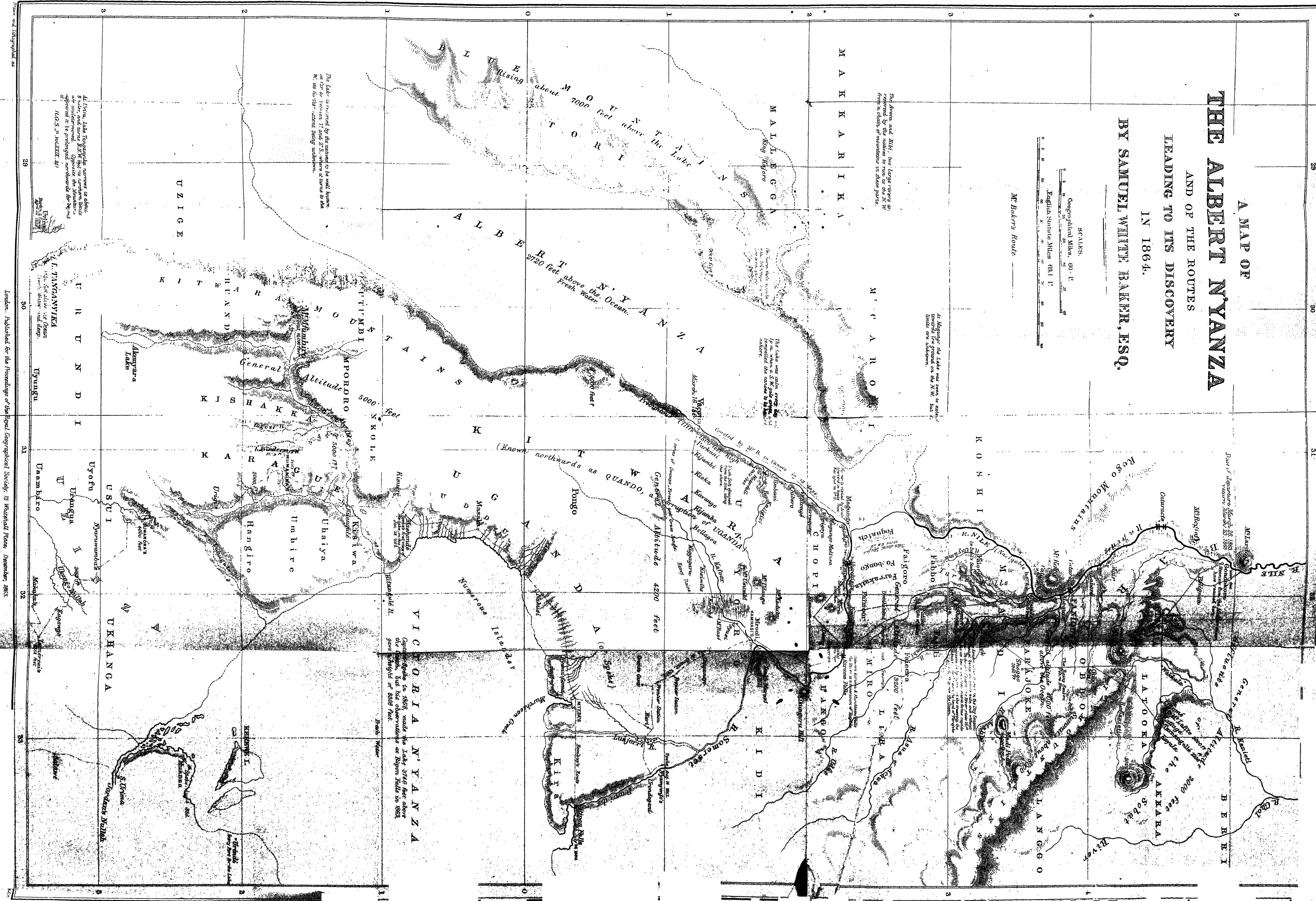
The above and other large rivers are shown by the names to run to the N. W. from a place of reference to their parts.

At Mungwa the Lake was seen, to which the low ground on the N. W. has been named.

The lake was seen, to which the low ground on the N. W. has been named.

The Lake is situated by the natives to be well known as far as latitude 1° and 2° S. where it turns to the N. W. as the 34° actual being unknown.

At N'yanza, Lake Tanganyika, narrow to about 8 miles, and turns N. W. but its eastern limits are undetermined. Opposite the 34° latitude it is prolonged, and shown for the 34° and 35° S. latitude.



PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[ISSUED 14TH DECEMBER, 1865.]

SESSION 1865-66.

First Meeting, 13th November, 1865.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

ELECTIONS.—*William H. Clark, Esq.; John S. Coysh, Esq.; Samuel C. Fox, Esq.; Commander J. B. Grove, R.N.; Warren S. Hale, Esq.; John Jebb, Esq.; J. Gwyn Jeffreys, Esq.; Lieut. F. C. H. Hallett; Colonel MacGoun; William Mackinnon, Esq.; Sir Robert Montgomery, K.C.B.; Paul F. Morgan, Esq.; William Pilkington, Esq.; Alexander Pringle, Esq.; Colonel Rivers, BOMB. ENG.; Samuel Spalding, Esq.; R. Temple, Esq.; Edward Wilson, Esq.*

PRINCIPAL ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, JUNE 12TH, 1865.—Berchet's '*Repubblica di Venezia*.' Presented by the Chevalier Cristoforo Negri. '*Travels through Naples in 1789*,' by C. W. de Salis. '*Giornale di Statistica di Sicilia*.' Vols. 1, 2, 3, and 5. '*The Dynamical Theory of the Formation of the Earth*,' by A. T. Ritchie. '*Portfolio Chinensis*; or a collection of Chinese State Papers,' by J. L. Shuck. '*Voyage en Crimée et sur les bords de la Mer Noire*,' by J. Reuilly, &c. &c. All presented by Sir Woodbine Parish. '*Exploration of Vancouver Island*,' by R. Brown, Esq. '*Reisen der Oesterreichischen Fregatte Novara um die Erde*,' 2 vols., by Dr. F. von Hochstetter. Both presented by their respective authors. '*Die Psychologie als Naturwissenschaft*,' 3 vols., by Dr. A. Bastian. Presented by the author. '*Ueber den Urstamm der Indo-europäischen Sprachfamilie, von D. G. D. Europæus*.' '*Inscriptions Runiques du Slesvig Meridional*,' par C. C. Rafn. '*Western Inland Provinces of China Proper*,' by Capt. R. Sprye. '*Annuaire du Senegal*,' 1864. '*Mémoires sur la Chine*,' par le Comte d'Escayrac de Lauture. '*Survey of the Sea of Aral*,' by Commander A. Butakoff, &c. &c. All presented by Sir R. I. Murchison, K.C.B.

'Austria,' by J. G. Kohl, Esq. Klaproth's 'Mémoires relatives à l'Asie.' Presented by S. M. Drach, Esq. 'Hydrologie du Nil,' par M. Lombardini. Presented by the author. Dr. Livingstone's 'Zambesi, and its Tributaries.' Presented by the publisher. Capt. Grant's 'Walk across Africa.' Palgrave's 'Arabia.' Ansted and Latham's 'Channel Islands.' Alcock's 'Japan.' Guyot's 'Earth and Man.' Continuations of 'Journals,' Periodicals, &c., of the various Societies.

PRINCIPAL ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING, JUNE 12TH, 1865.—MS. Map of the Journey by Messrs. Chapman and Baines, from Walfish Bay to the Victoria Falls; on 15 sheets; scale 1 inch = 8 miles; accompanied by various photographic views of scenery; presented by Mr. Chapman. River Amur, by M. Schwartz; on 7 sheets. Holy Land, by Van de Velde; 8 copies. A Map of Eastern Siberia, including Mongolia and Manchuria, &c., by Semenov. French Admiralty Charts, 75 in number. Chart of Spitzbergen, by Nordenskiöld. Maps of India, by Lieut.-Col. Thuillier, 46 in number, on 102 sheets; presented by Col. Thuillier. Maps of Eastern Australia, showing the routes of Messrs. Jardine and McDonald, from Queensland to Cape York; presented by Sir Geo. Bowen, through the Colonial Office. Russia in Europe, by Dr. Kiepert, 6 sheets; presented by the author. Ordnance Maps, 928. Admiralty Charts, 26 in number. Atlas of Relief Maps, by C. Raaz; presented by Dr. Lüdde.

THE PRESIDENT, in opening the Session, addressed the Meeting as follows:—

GENTLEMEN—We re-assemble for this Session under circumstances which must gladden the heart of every geographer. As none of us can forget the enthusiasm which greeted the lamented Speke and his gallant associate Grant on their first appearance in this hall after their successful exploit in tracing the Nile to its mouth, from the great Lake Victoria Nyanza in the heart of Equatorial Africa, so may we well rejoice when we now welcome to his country that most enterprising, skilful, and large-hearted traveller, Samuel Baker. This traveller has not only verified many important points in the deductions of his lamented precursor, but has discovered that the Luta or Muta Nzigé of Central Africa—sketched out by Speke from native reports—is a deep and vast rock-basin, having a length of 260 miles, or about as long as Scotland, exclusive of what may be its southerly and unknown boundary, and that, unlike the Victoria and most other African lakes, it is subtended by high shores composed of hard granitic rocks.

Let me call your attention specially to one or two only of the salient points in the conduct of the man who is now happily among us, and who, by his devotion to geographical science, has worked out, entirely at his own cost, this grand addition to our previous knowledge. Distinguished as an explorer in Ceylon and Upper Egypt, and particularly in having determined the nature of the affluents of the Athara, that great tributary of the Nile, and in fixing many positions thereon, Mr. Samuel Baker was no sooner made acquainted with the perilous and exhausted condition in which Speke and Grant were expected to emerge from Equatorial Africa, and also with the unforeseen disasters which had befallen our envoy Petherick, who was commissioned to carry succour to the travellers—disasters which would render him unable to assist them—than, at his own cost, he fitted out an expedition, and, carrying with him adequate supplies, was the first to relieve their wants. It was for this noble conduct, as well as for the gallant and determined manner in which, undaunted by all the dangers through which Speke and Grant had struggled, he resolved to go forward into the country of the Equatorial King Kamrasi, there to work out that important portion of the course of the Nile which was left undetermined, that we awarded to him our Victoria Medal.

The difficulties which our traveller had to overcome immediately after the departure of Speke and Grant were, indeed, more than enough to paralyse the ardour and check the energy of any man. For the natives whom he had engaged to transport his provisions and goods mutinied, and, separating into two parties, proceeded to make *razzias*—or marauding forays—for the ivory and slave traders, upon tribes at some distance to the east. Being thus rendered wholly unable to proceed direct towards the country he was bound to examine, Baker followed up the lesser party of the mutineers far away to the east, and, by gifts, promises, and able management, contrived to win over a sufficient number of these people to transport his goods. This he effected the more readily after the larger party of 104 persons had been, to a man, killed by the brave natives of the Latooka tribe, who defended their independence against these villainous slave-hunters.

I have here to announce, and with a pride and gratification that will, I know, be shared by every one in this assembly, that in all his arduous and perilous travels our medallist was accompanied by Mrs. Baker, to whom, as he himself has told me, much of his success is due, and who, by her conduct, has shown what the wife of a gallant explorer can accomplish in duty to her husband. Well, indeed, may she be proud of him who has won our highest

honour, and who is now welcomed home by us with such enthusiasm and with our warmest thanks. Following up the researches of Speke, who had called the great higher lake the Victoria Nyanza, in honour of our gracious Sovereign, Baker has most appropriately raised a lasting memorial of Her Majesty's lamented and enlightened Consort, by affixing to this second great lake of the Nile the name of Albert Nyanza.

Besides the grand addition to the geography of Inner Africa made by Mr. Baker, I have the pleasure to inform you that, in other parts of Africa, measures are in active operation which will greatly enlarge our acquaintance with that continent. Thus, our medallist Baron C. von der Decken—an explorer who, like Mr. Baker, is doing everything at his own cost—writes to me that, after seven months of tedious preparation, assisted by our naval authorities, in getting his iron river-steamers put together, his expedition is fully equipped, and that he is on his way to penetrate Eastern Africa, north of Zanzibar. His intention is first to explore the Thula and Shamba rivers, and afterwards to ascend the Jub; for this purpose he has taken with him two small steamers, one of which was towed from Zanzibar to Thula by H.M.S. *Lyra*—Capt. Parr, the commander of that vessel, having greatly assisted him. His party consists of 10 Europeans and 32 Africans (including two of Captain Speke's men); but it is his intention to take with him only 15 or 20 in his projected journey overland from the limit of navigation on the river.

In reference to the geography of the Upper Nile, it gratifies me to state that, in the next volume of our Journal, the course of the various affluents of the great stream to the west of Gondokoro will be correctly laid down by Mr. Arrowsmith, from astronomical observations and compass-bearings contributed by Mr. Petherick and his assistant Dr. Murie.

Our latest news of the courageous explorer M. Du Chaillu is contained in a letter sent to us from the Gaboon, by Mr. R. B. N. Walker, and dated the 23rd of June. According to him, reports had been received to the effect that M. Du Chaillu and his black people, about 100 in number, had some months previously reached the Ashira country, about 150 miles from the coast. He was detained there for a long time, but had recently been allowed to proceed; not, however, without paying very heavily for the permission. The small-pox had broken out amongst the Ashira tribe simultaneously with M. Du Chaillu's arrival, and this circumstance was the chief cause of the obstacles placed in his way, as the natives attribute the introduction of the disease to the white man. It was, however,

believed that he had passed beyond the Ashira country towards the unknown interior, and since then no further news has been received from him.

As regards African explorations now in operation, I have furthermore to state that when I last heard from Livingstone he was making due preparations at Bombay to penetrate once more from the east into the interior, but in more northern latitudes than those hitherto visited by him. Already under the enlightened encouragement of the Governor, Sir Bartle Frere, he has engaged to accompany him several natives of the African interior who had learnt trades, and has purchased buffaloes in the hope that these animals would be able to withstand the bite of the tsetse fly. Looking forward, as we must, with intense interest to the results of the present endeavour of this gifted man, who has already done so much to advance geographical science whilst labouring as a zealous missionary, and as a hearty enemy of the slave trade, I venture to anticipate that on this journey, if his life be spared, he will be enabled to determine finally the true watershed of Southern Africa.

In making these observations, I am naturally led to recall your attention to the great discoveries of the lamented Speke, now that the results of his journies have been to so remarkable a degree confirmed by Baker. I therefore express the hope that the monument we are about to erect to his memory may not lack due completion for the want of the small additional sum which is required to carry out the design. A granite obelisk, similar to that erected to Lieutenant Bellot, at Greenwich, is now nearly finished, and the site for its erection in the metropolis will soon be fixed upon.*

In the course of our Session many other topics of great interest will be discussed besides those which relate to Africa.

Such, for example, will be the recent explorations in North-Eastern Australia, by the brothers Jardine and other travellers, to which Sir George Bowen, the energetic and successful Governor of Queensland, has directed my attention. Such also are the researches now in operation to trace the last route of Leichhardt, which, if they fail in discovering that any of the party are still living, will most certainly add greatly to our acquaintance with the nature of that great continent, so large a portion of which our countrymen have successfully colonized. On this account I trust that the benevolent efforts of Dr. Mueller and the ladies of Victoria, who have established a fund to liquidate the expenses of the search, augmented, as I have just learnt, by the sum of 1000*l.*,

* Subscription lists are open at 15, Whitehall Place, and at Messrs. Coutts, and Messrs. Cocks and Biddulph, bankers.

munificently voted by the Parliament of Queensland, will be supported by geographers at home.

We shall also have brought before us much curious and novel information respecting vast regions of North-Western Brazil, watered by the Purus and other affluents of the Amazons, which will enlighten us with regard to the great extent of country in the interior of South America that yet remains to be explored. We expect, too, contributions regarding the geography of that portion of our globe which is considered to have been the birth-place of the human race—the western portion of Central Asia; for we are compelled to admit that we know really less of these countries than was known to the ancients, the recent labours of Russian explorers along the northern borders of Central Asia and the course of the Jaxartes revealing to us fresh knowledge as to the direction and nature of many mountain chains, and the course of several important streams, in that unknown region.

But these subjects will be more largely treated of in my anniversary address in May, and I now revert to the topic with which I began, and beg to direct your attention this evening exclusively to the bold and eminently successful explorations of Mr. Samuel Baker. I will only add that the sketches of scenery and the inhabitants which Mr. Baker has brought home with him are of the highest interest, and when published will ensure our commendation.

I now call on Mr. Baker to make his communication.

Mr. BAKER then read the following Paper:—

Account of the Discovery of the second Great Lake of the Nile, Albert Nyanza. By SAMUEL WHITE BAKER, Esq.

IN the year 1861 I commenced an expedition to discover the sources of the Nile, with the hope of meeting the East African Expedition of Captains Speke and Grant. I had not the presumption to make my intention public, as the Nile source had hitherto defied all explorers; but as the insignificant worm slowly bores its way into the hardest oak, even so I hoped by perseverance to reach the heart of Africa.

I employed the first year in exploring all the Nile tributaries from Abyssinia,—the Athara, Settite, Royān, Salaam, Angrab, Rahad, Dinder,—and thence descended the banks of the Blue Nile to Khartúm. I will not describe this journey, but will confine myself to the most important point—the Great White Nile.

I completed my arrangements at Khartúm, and started on the 18th December, 1864, with a powerful force in three vessels, with

twenty-nine transport animals, including horses, camels, and asses.

The first tributary to the White Nile is the Sobat, from the south-east, in lat. $9^{\circ} 21' 14''$ N. This river is 120 yards wide and 28 feet deep, with a current of $2\frac{1}{2}$ miles an hour, when bank-full, which it was at that time (December). It is not navigable for more than about 180 miles, as it is composed of seven or eight distinct streams, all shallow, the conjunction of which forms the main river.

Turning to the west from the Sobat junction, the Bahr Giraffe is met with on the south bank; this is an inferior stream, being a mere arm of the Nile, which leaves the parent stream in the Aliab country about $6^{\circ} 30'$ N. lat. Continuing west from the Bahr Giraffe we arrive at the Bahr Gazal junction coming from the west, about 70 miles from the Sobat junction. The Bahr Gazal is dead water. From that point to the south the difficulties of the White Nile commence. The entire country is a dead flat, a world of interminable marsh overgrown with high reeds and papyrus rush. Through this region of desolation the river winds its tortuous course like an entangled skein of thread; no wind is favourable, owing to the constant turns; the current adverse; no possibility of advance except by towing, the men struggling night and day through water and high rushes with the tow-rope, exhausted with a hopeless labour and maddened with clouds of mosquitoes.

Far as the eye can reach, in that land of misery and malaria, all is wretchedness. The dull croaking of waterfowl, the hum of insects, and the hoarse snort of the hippopotamus, impress the traveller that this is the mysterious Nile whose source lies hidden from mankind. Islands of vegetation silently float past, bearing solitary storks, thus voyaging on Nature's rafts from lands unknown. Nothing in life is so depressing as this melancholy river. One dry spot I saw slightly raised above the boundless marsh; there some white man was buried. The people were ignorant of his nation; but his bones, like a good ship stranded in her voyage, formed a sad landmark for the passer-by. Not far from that spot I also had to dig a muddy grave, and erect a rough cross over poor Johann Schmidt, a good and faithful German whom I had engaged for my expedition. He, at this early stage, fell a victim to the marsh fever—another wreck upon the fatal banks of the White Nile. The loss of a good man, my only European, so early in the voyage, affected me deeply. Sorrowfully I left him in that lonely spot, and struggled on against the stream to Gondokoro.

I arrived at Gondokoro after 45 days' voyage from Khartúm, about 750 miles in a direct line, lat. $4^{\circ} 55'$ N. I landed all my

animals in excellent order, and resolved to wait for the arrival of a trader's party from the south, according to my prearranged route, intending to form a depôt at their station in latitude about $3^{\circ} 15' N.$, to which I could fall back for supplies in case of need.

Gondokoro is a miserable place, consisting of a number of grass huts, occupied only at one season by the traders' people, when they return from the interior with their slaves and ivory. The soil is poor, but the country is pleasantly diversified with many evergreen trees and native villages, while the distant mountains, towards the south and east, produce an exhilarating impression after the tedious White Nile marshes.

I had been 15 days waiting at Gondokoro, when suddenly I heard guns firing in the south, and my men rushed into my cabin, saying that the trader's party had arrived, with two white men—*Englishmen*—in their company, who had come from the sea! It is impossible to describe that moment. Quixotic dreams that I had cherished were now realised, and in a few minutes later I met those gallant explorers Captains Speke and Grant marching along the river's bank; arriving in honourable rags, careworn, haggard, but proud of having won.

Speke was my old friend, but I felt that his brave companion Grant was also an old friend, for such a meeting in the centre of Africa vanquishes all time, and the hearty shake of the hand effects more than the cold acquaintance of years. But one disappointment tinged this happy meeting. I had always hoped to have found them somewhere about the Nile source, and to have shared with them the honour of the discovery. I had my expedition in the most perfect order, and I was ready for any place however distant. Happily, much remained to be completed. Speke informed me that he had heard from the natives that a large lake existed to the west of Unyoro, which he thought might be a second source of the Nile, as the river flowed into it, and almost immediately after its junction issued from it, and continued its course to Gondokoro. He also said that he and Grant crossed the river at Karuma Falls in about $2^{\circ} 20' N. lat.$, where they lost the river as it turned suddenly to the west; therefore it was of the highest importance to explore it from that point to the lake, which he called the Luta N'zigé. I immediately determined to undertake this exploration, feeling convinced that the reported lake had an important position in the basin of the Nile.

My hopes of success were considerably damped by the character of my men. In those unknown regions every species of villainy can be perpetrated unpunished, and a collection of scoundrels, including Europeans, were engaged in the so-called ivory trade,

having armed bands of ruffians in their service, who not only robbed the natives of their women and children to sell as slaves in the Soudan, but whose ivory purchases were conducted by *razzias* upon the cattle of the natives, the animals thus stolen being exchanged for elephants' tusks with the adjoining tribes. The trade of the White Nile is simply cattle-stealing, slave-hunting, and murder.

I had thus to encounter two great difficulties: the hostility of the natives, caused by the above conduct, and the impossibility of procuring porters for beads and bracelets, cattle being the only medium of exchange; added to this, my men engaged at Khartúm as escort were the scum of the earth, accustomed to cattle-lifting and slave-hunting, and in the habit of receiving from their employers one-third of the cattle stolen. Foreseeing these difficulties when at Khartúm, I had applied, through the British Consul at Alexandria, to the Egyptian Government for a few troops as escort. This application was refused, although the Dutch ladies obtained Government soldiers and an officer through the application of the *French* Consul at Khartúm.

A few days after the departure of Speke and Grant from Gondokoro, my men mutinied and refused to proceed. The traders had combined to prevent any European traveller from penetrating the interior, fearing reports upon the slave trade. The people of Andrea Debono, who, having escorted Speke and Grant, had agreed to give me porters and to accompany me to their camp, suddenly started without me, sending a message that they would fire upon my party should I attempt to follow on their path. My armed men, forty in number, kept forcible possession of my arms that were in their hands, and threatened to fire at me simultaneously should I attempt to disarm them. It appeared utterly hopeless to proceed. The Bari tribe at Gondokoro and for about four days south were hostile to all comers. My expedition, so carefully organised, was overthrown and apparently defeated. The fatality that had attended all expeditions to the Nile sources for two thousand years hung heavily upon me.

I had no longer an escort. One man alone was faithful: he was a native of the Djour. This man and a little black boy of twelve years old were all that remained of my party, with the exception of my wife, who, with a devotion which woman alone can show, determined to face all dangers and hardships rather than that we should return defeated.

I will not weary you with a minute account of how, by management and caution, I recovered my arms and ammunition from the mutineers. Having succeeded in frightening a few of them, seven-

teen agreed to follow me to the *east*. My proper course was south; but I agreed to the proposal of the men, as they obstinately refused to proceed in any direction but east. I discovered that they had conspired to desert me at the camp of a trader, seven days' march east from Gondokoro: this was their reason for insisting upon that direction. They had also threatened to fire at me should I attempt to disarm them on the road, and to desert my wife in the jungle after my death. Nevertheless, it was imperative that I should advance from Gondokoro at all hazards, or give up the expedition. I trusted to gain an influence over my men when once in the interior, and to be able then to alter my course to the direction of the lake.

I endeavoured to make terms with a trader's party bound for the east, but failed; they sent word that they would fire at me if I followed their route, and that they would raise the Ellyria tribe against me in advance. This party started on the 26th of March, 1863, at about 2 P.M., and I determined to follow on their tracks that night and take my chance of overcoming all obstacles on the road. Not a single native was procurable, all being under the influence of the traders; thus I had neither guide nor interpreter. I loaded my camels and asses, and at 7 P.M. followed in the direction the traders' party had taken.

I overtook them that night, bivouacked upon the road, and I pushed on ahead. The next morning I received two natives of the Latooka tribe, who, having been ill-treated by the Turks, had absconded. Fortunately I had been kind to these very men when in Gondokoro, and they, being natives of the country to which we were bound, offered to act as guides for a large present of beads and bracelets. Here, then, were guides! and I determined to push on by a forced march at night to reach and pass through the Ellyria tribe before the Turks should arrive to raise that tribe against me.

The march of that night was heavy. The camels were carrying about 700 lbs. each; the asses 200 lbs. I had twenty-nine animals. The route was through jungle and obstructed by numerous ravines, in crossing which the camels always fell and had to be unloaded. While they were being reloaded the tired donkeys took the opportunity of reposing and lying down; they shifted all their packs, which thus had to be readjusted a dozen times in that one night's march.

The day broke, and we were still ahead of the Turks. I lightened the loads, throwing away most of the salt and about 300 lbs. of all kinds of provisions, which, being left on the road, had the double advantage of lightening the burthens and delaying the Turks, who

I knew would scramble and fight together for the spoil upon the route. At length I passed a place called Tollogo, about 30 miles east of Gondokoro, and threading a rocky pass at the foot of a range of fine granite mountains, I passed on to Ellyria, riding about a mile ahead of my party.

Tying our horses to a tree, my wife and I, alone in this beautiful spot, sat upon one of the huge blocks of granite that had fallen from the mountain top, and looked down upon the valley of Ellyria, about a mile before us. The noble mountains of grey granite rose on the borders of the chief village, while numerous other villages, surrounded by bamboo stockades, were dotted about the steep sides of the mountains. Looking down upon this valley in which our fate lay hidden, we anxiously awaited the arrival of our party—the road being difficult for the baggage animals, owing to the numerous fragments of rock which blocked the pass. We were exulting in having outmarched the Turks before they could raise the Ellyria tribe against us, when a clattering among the rocks preceded the appearance of what I supposed to be our party. To my confusion I saw the hated red flag and crescent, leading the Turks' party of 140 men. One by one they filed by through the narrow pass and descended to Ellyria. We were outmarched, and the expedition ruined should they raise the chief against us, he being the man who had massacred a trader's party of 126 armed men the year previous.

The captain of the party at length passed within a few yards of me in the rear of his men: my success depended upon that moment. I called him, and a present of a double-barrelled gun opened the conversation; it was terminated by English gold, which by good fortune I had with me—I had won him! I explained to him that it was impossible to drive me back, but should he assist me in my journey, I would reward him far beyond his annual salary. My men shortly arrived, and were confounded at seeing that I had made a friend of one of my greatest enemies.

After seven days' march we arrived at Latooka, my party slightly in the rear of the trader's. We reached the station of Chenooda, an opposition company to that which I had been following. It was at this spot that my men had conspired to mutiny. At daybreak the next morning the men refused to load the camels, and broke out in open mutiny with their arms in their hands. I made a severe example of the ringleader and thus cowed some of the party, while some absconded with their arms and ammunition and joined Chenooda's men. The party of Chenooda made an attack upon the Latookas two days later, to procure slaves; but the Latookas, who are a splendid tribe, massacred them, entirely destroying 105 men, in-

cluding four of my deserters. This event gave me the control of my remaining men, who, firmly believing in the "evil eye," imagined that I had some mysterious connection with this disaster.

Latooka is the finest country that I have seen in Africa: the natives are warlike, but friendly if well treated. A large tract of land is cultivated with several varieties of grain, enormous herds of cattle find ample pasturage, and the towns are large and thickly populated. Tarrangollé, the chief town, contains about 4000 houses. Every town is defended by a strong stockade, while sentries are posted day and night around the town upon high platforms. The men are, like all tribes of this part of Africa, completely naked, and they are distinguished from other tribes by a peculiar head-dress—the hair or wool being worked into a thick felt and arranged as a helmet; this is tastefully arranged with blue and red beads, and ornamented with polished copper plates. The Latookas never bury the dead if slain in fight: those who die a natural death are exhumed after a few weeks' interment—the bones are then placed in earthenware pots and exposed outside the town. Like all other tribes of the White Nile they have no idea of a Deity, nor even a vestige of superstition; they are mere brutes, whose only idea of earthly happiness is an unlimited supply of wives, cattle, and a kind of beer.

The country of Latooka is important as being on the east frontier of a mountain-range running from the south-east, which forms the watershed between the White Nile and the Sobat; the drainage to the east flowing to the Sobat, about 50 miles distant, by the River Kanieti, and that to the west flowing direct to the Nile. This mountain-range is from 4000 to 5000 feet high, and composed entirely of granite. My intention in leaving Gondokoro for this country was simply to make a move into the interior, whence I trusted to be able to change my route and work round to the south-west to Unyoro, and from thence to the lake. Accordingly I crossed the mountain-range, and steering south-west 40 miles from Latooka I arrived at Obbo in lat. $4^{\circ} 2' N$. The general level of the Obbo country is 3600 feet above the sea: it forms the watershed between the East and West, and has a great rainfall of ten months during the year. The soil being extremely rich, the country is covered with an impenetrable grass jungle, about 12 feet high, intermingled with wild grape-vines. The mountains are clothed with forests, the whole country abounding in elephants.

Cattle will not live, owing to the tsetse fly: thus the natives are inferior in strength to the Latookas, being badly fed. They are extremely indolent, and, instead of cultivating their beautiful soil, they are contented with small patches of a wretched grain and a

harvest of wild yams, which grow in abundance. I found nine varieties of yam growing wild in the Obbo jungles.

The chief of the Obbo tribe is an old man, a famous magician and rain-maker, much respected by all adjacent tribes as a powerful sorcerer. He carries a whistle of antelope's horn, which is supposed to have the power of either bringing or preventing rain. Unfortunately one day I happened in his presence to whistle shrilly with my fingers with a tone which utterly overpowered his magic horn. From that time I was considered to be an accomplished rain-maker, and was always requested to perform either to attract or to retard a shower. The old chief "Katchiba" has 116 children living, and all his villages are governed by various sons. When he visits a district he rides on a man's back, with a few attendants, while one of his wives carries a jar of beer to refresh both horse and rider. He thus journeys through his country to collect tribute: if not paid, he curses the goats and fowls of his subjects, that they may remain barren, and threatens to withhold the rain.

In Obbo the whole of my transport animals died, and I was utterly helpless. After a delay of many months, during which the rainfall was exceedingly great, I procured a few porters from the ivory trader, and having trained some riding oxen, I was prepared to start for Unyoro. I was forced to abandon nearly all my baggage, as my means of transport were very limited. My clothes and those of my wife had long since been bartered for provisions with the trader's men; thus my baggage was light, consisting of a simple change of linen, with a large supply of ammunition, and presents for the King of Unyoro (Kamrasi). I had been a martyr to fever, and my quinine was exhausted; my work still all before me. I had arranged to lead the trader's party into the Unyoro country, and to introduce them to Kamrasi, under the express conditions that they should deal fairly with the King.

We left Obbo on January 5, 1864, crossing the River Atabbi, which is an important tributary to the Asua River, flowing throughout the year. I passed through the Madi country to Shooa, in latitude $3^{\circ} 4' N.$, crossing the Asua River in lat. $3^{\circ} 12' N.$ The Asua at that time (January 9) was dry, with the exception of a narrow stream, ankle-deep, trickling down its rocky bed. It is about 120 yards wide, but it is a simple mountain-torrent. The average depth in floods, judging by the water-mark on the banks, is 15 feet; so great is the inclination of its bed, that it forms a rapid during the rains, impassable by boats. The bed of the river was 1100 feet lower than Obbo; the drainage of a large extent of country thus flows to the Asua, and thence to the Nile.

Upon arrival at Shooa the whole of my porters deserted: this necessitated a further diminution of baggage. Rice, coffee, and every necessary, was forsaken, and, with a few men to carry ammunition and blankets, we pushed forwards towards Unyoro.

After five days' journey south, over uninhabited prairies of high grass and countless swampy hollows, we arrived at the Nile* at Karuma Falls, at the very spot where Speke and Grant had crossed the river, in latitude $2^{\circ} 17' N$. Instead of being welcomed by Kamrasi, as I had expected, we were not allowed to cross the river; crowds of armed men thronged the heights on the opposite bank to resist our landing. At length, after a long day lost in gesticulating and shouting our peaceful intentions, a boat came across the river with some head-men of the country, who, after strict examination, pronounced me to be Speke's own brother, "from one father and one mother." It now transpired that Debono's men, who had escorted Speke and Grant to Gondokoro the previous year, and who had driven me from my southerly route, had marched direct to Unyoro and attacked Kamrasi's country, killing about three hundred people, and capturing many slaves. We were at first supposed to be some of that party. So strong was the suspicion of the natives, even after my examination, that none of our party were allowed to cross the river except my wife, myself, and two or three attendants. It was pitch-dark when we landed on the south bank just under Karuma Falls; and although met by a crowd playing upon flutes, horns, and drums, apparently with great rejoicing, we were detained for eight days before we were allowed to journey south to Kamrasi's residence.

From Karuma the Nile flows due west in a succession of powerful rapids between high cliffs. Immense groves of bananas clothed the steep ravines, and beautiful forest-trees, interspersed with varieties of palms, bordered the beautiful river, rushing along its rocky bed. Here the Nile was about 150 yards wide, a noble stream fresh from the Victoria Lake.

My first wish was to follow the river from this point to the supposed Luta N'zigé, but this was not permitted; neither could I obtain information of any kind from the people, as they had not yet received the King's orders. So suspicious was the King, that we were twelve days on a march of only 40 miles due south to his

* As that portion of the Nile which flows from the Victoria, into the Albert Nyanza, requires a separate name to distinguish it from the main river of the Nile flowing out of the Albert Nyanza, I have, on my map, adhered to the name Somerset River, given to it by its discoverer Captain Speke on the map which he gave me at Gondokoro, and which I have handed over to the Royal Geographical Society.

capital. We were only allowed to march about $3\frac{1}{2}$ miles per day, to enable messengers to report our conduct daily to Kamrasi. This march was on the west bank of the Nile, and we arrived at the capital (M'rooli), at the junction of the Kafoor River with the Nile. The country throughout our route from Karuma was thickly populated and extremely fertile.

The King did not appear for three days, during which we were by his orders confined on a wretched marsh on the south side of the Kafoor River, precisely where Speke and Grant were located formerly. In rather a suspicious manner Kamrasi arrived, accompanied by about a thousand men. I was very ill with fever, and was carried on a litter to his hut. He was a fine, dignified-looking fellow, well dressed in bark-cloth, gracefully draped around him, and beautifully clean in his person; the nails of his hands and feet being perfectly white, and carefully attended to. He gave me seventeen cows, and a quantity of plantain wine; accordingly, I presented him with a variety of objects of value, including a handsome Persian carpet of most gorgeous colours, which captivated him immensely. I told him that Speke and Grant had arrived safely, and had spoken well of him, therefore I had come to thank him in the name of my country, and to present him with a few curiosities. I also told him that the Queen of my country had taken a great interest in the discovery of the Nile source, now proved to be within his dominions, and that I wished to visit the Luta N'zige Lake, and descend to the junction and the exit of the river. He told me that Speke was evidently my brother, having a beard precisely similar; that I was far too ill to attempt the march to the lake—which was the *M'wootan*, not *Luta N'zige*—as it was *six months' journey*; that he was afraid I might die in his country, and perhaps my Queen would imagine I had been murdered, and might accordingly invade his territory. I replied that this was a perfectly correct idea—that no Englishman could be murdered with impunity; but that I had resolved not to leave his country until I had seen the lake, therefore the sooner the exploration was completed, the less chance there would be of my dying in his country.

I returned to my hut disheartened. I had now been fourteen months from Khartúm, struggling against every species of difficulty; for twelve months I had been employed in repairing guns, doctoring the sick, and attending the wounded of the ivory hunter's party, simply to gain sufficient influence to enable me to procure porters. That accomplished, I had arrived at this spot, M'rooli, in lat. $1^{\circ} 37' N.$, only 6 days' march from the Victoria Lake; and I had hoped

that a 10 days' westerly march would enable me to reach the M'wootan N'zigé. I now heard that it was *six months' journey*! I was ill with daily fever, my wife likewise. I had no quinine, neither any supplies, such as coffee, tea, &c.; nothing but water and the common food of the natives—good enough when in strong health, but uneatable in sickness.

That night passed heavily; the following morning, to my dismay, every one of my porters had deserted. They had heard the King declare the journey to the lake to be *six months*, and all had absconded. Day after day I had interviews with the King Kamrasi, whose only object in seeing me was to extort all I had. I gave him everything he asked for except my sword: this was what he coveted.

The traders obtained a large quantity of ivory and left the country, leaving me, with my thirteen men, sick and hopeless. I would not be persuaded to return: I felt sure that the lake was not so far distant. Hearing that the trade from the lake consisted of salt, I found a native dealer, and from him I obtained the cheering information that the lake was only 15 days distant. The King had deceived me, merely wishing to detain me with him in order to strip me of everything. At length I gave him the coveted sword and a double-barrelled gun; my head-man drank blood with him as a proof of amity, and he gave me two chiefs as guides and about three hundred men as escort. These fellows were dressed like our juvenile ideas of devils, having horns upon their heads, and were grotesquely got up with false beards made of the bushy ends of cows' tails. This motley escort gave much trouble on the journey, plundering the villages *en route*, and drawing all supplies before we had a chance of procuring anything: I therefore discharged my attendants after a few days' march, and continued the journey with my guides and porters. Every day the porters, apparently without reason, would suddenly throw their loads down and bolt into the high grass, disappearing like so many rabbits. This occasioned much delay, as fresh men had to be collected from distant villages.

Marching for some days along the south bank of the Kafoor River, we had to cross this deep stream at a muddy ford; in crossing this river my wife suddenly fell apparently dead, struck by a *coup de soleil*. For seven days she was carried in a state of insensibility along our melancholy route; the rain in torrents, the country a series of swamps and forest and grass jungle—no possibility of resting in one place, as there was nothing to eat on the road and our provisions were insufficient. The people put a new handle to

the pickaxe to dig her grave, and looked for a dry spot. I was utterly exhausted with fever and watching, and, after a long march, I fell senseless by the side of her litter. The next morning a miraculous change had taken place, which I can never forget.

After 18 days' journey through a park-like country from M'rooli, the long-wished-for lake was announced by the guide. For three days I had seen a high range of mountains, apparently about 80 miles distant, and I had feared that these lay between me and the lake; to my great joy I now heard that they formed the opposite or western shore. Suddenly, upon reaching some rising ground, the great reservoir of the Nile lay before me! Far below, some 1500 feet beneath a precipitous cliff of granite, lay my prize so hardly sought; a boundless sea-horizon south and south-west; while west, the faint blue mountains, of about 7000 feet above the water-level, hemmed in the glorious expanse of waters.

Weak and exhausted with more than twelvemonths' anxiety, toil, and sickness, I tottered down the steep and zigzag path, and in about two hours I reached the shore. The waves were rolling upon a beach of sand; and as I drank the water and bathed my face in the welcome flood with a feeling of true gratitude for success, I named this great basin of the Nile (subject to Her Majesty's permission) the "Albert Nyanza," in memory of a great man who had passed away. The Victoria and the Albert Lakes are the reservoirs of the Nile.

Vacovia was the spot where I first reached the lake, in lat. $1^{\circ} 14'$ N. From that place I started in canoes, and, steering north, I coasted for 13 days, arriving at Magungo, in lat. $2^{\circ} 16'$ N. There the lake had decreased in width to 16 or 20 miles, and it turned to the west; the extent unknown to the natives.

The village of Magungo was situated on rising ground about 250 feet above the lake; from this spot I had a beautiful view of the valley of the Nile, as the river flowed from the lake from 15 to 20 miles due north of our position. The valley was 4 or 5 miles wide; a great flat of green reeds marked the course of the river to the north as far as the eye could reach. A chain of hills bounded the west bank of the river, trending north-east. Below the village of Magungo the river which I had crossed at Karuma entered the lake, after a course of about 80 miles from Karuma Falls; thus the Nile entered the lake and almost immediately made its exit at the north, precisely as had been reported by the natives to Speke and Grant.

My voyage down the lake had been tedious, owing to the heavy sea which rose with the wind from the south-west every afternoon,

and rendered it necessary to haul the canoe ashore. The scenery was extremely beautiful; the mountains of granite and gneiss rose in many places abruptly from the water to the height of 1200 to 1500 feet on the east shore; many streams rushed down precipitous ravines; and the fine cataract of the Kaigiri, in a grand body of water, fell from about 1000 feet. Two large falls were visible with the telescope, issuing from the high range of mountains on the west shore; in fact, all nature seemed to recognise this great depression as the grand reservoir.

Much salt is obtained from the soil on the east bank of the lake; this forms the sole article of trade of the population on its borders. Formerly Magungo was a town of considerable importance, as the trade from Karagwé, from 2° s. lat., was conducted in large boats sent by Rumanika, the king of that country, with cowrie shells and brass bracelets from Zanzibar in exchange for ivory. My interpreter (a woman of Magungo) told me that she had seen Arabs arrive at Magungo with those boats, who regularly brought cowrie shells every year in exchange for ivory and prepared skins. In a disagreement with the people some men were killed, and from that time no boats had arrived; thus cowrie shells were very scarce, and tribes to the north, *i.e.* the Madi and Obbo, who formerly sent to Magungo to purchase those shells, were now without a supply.

Kamrasi, and many natives, told me that the lake is known well as far as Karagwé; but from that part, between 1° and 2° s. lat., it turns to the west, the extent being unknown even to Rumanika, the King of Karagwé. Thus the Albert Lake is well known to an extent of about 260 geographical miles from south to north. Throughout this course it receives the drainage of a great equatorial mountain-range, where the rainfall continues through ten months of the year. When I reached the lake in March, it was shortly after the commencement of the rains (which begin in February); at that time the water was 4 feet below the highest water-mark upon some trees which grew in the lake near Magungo. The natives assured me that the level was never lower than at the time I saw it; thus the maximum rise of the water-level in floods is 4 feet. From the exit of the Nile to lat. 3° 32' n. the Nile is navigable.

It was necessary to verify the river flowing into the lake at Magungo as the Nile I had crossed at Karuma, that being the river flowing from the Victoria Nyanza. At the junction with the Albert Nyanza it was a broad channel of dead water, banked by vast masses of high reeds. In fact the northern end of the Albert Lake seemed to form a delta, the shores being blocked with rush-banks.

The whole character of the lake had changed from the open sea it had presented further south.

I went up the river from Magungo in a canoe. After the first 10 miles it had narrowed to a width of about 200 yards, without any perceptible stream. We slept that night on a mud-bank, within a few feet of the river; but on waking the next morning I distinctly noticed the floating vegetation slowly moving towards the west. Thus there was no doubt that this was actually the Karuma River, as the natives had informed me, flowing into the lake at Magungo.

About 25 miles from Magungo my boating terminated. For many hours I had heard the roaring of broken water; we now turned into a slight bend of the river, and the grand fall of the Nile rushed into our view. Hurrying through a gap in a granite rock the river contracted suddenly from a width of 150 or 200 yards to about 50 yards, forming a maddening rapid, which, roaring through its rock-bound channel, plunged in one leap, about 120 feet perpendicular, into a deep basin below. I took the liberty of naming this grandest object throughout the course of the Nile the "Murchison Falls."

I counted twenty-seven crocodiles upon one sandbank below the falls. I shot one, and, as we were putting the boat ashore, a hippopotamus which had been hidden in the reeds charged the canoe, lifting it out of the water, and very nearly terminated the voyage with a capsizing.

Leaving the canoes at a small fishing-village below the falls, we continued our route to the east, overland, parallel with the river. The war was raging between Kamrasi and a neighbouring chief, Fowooka, who lived upon some islands in the river. The whole country was plundered and deserted; my porters absconded, leaving us in utter helplessness without provisions. Here, laid down with fever and starvation, we remained for two months, living upon wild spinach and mouldy flour, now and then procuring a wretched fowl. During this time Kamrasi, who was camped with an army of 5000 men only four days distant, sent me repeated messages that I was to attack his enemy, Fowooka, with my guns. Should I accede to this, he promised to give me all I wanted, even to a portion of his kingdom. Being in extremity, I at length sent my head-man to the King's camp with a message that I was far too great a man to be negotiated with by a third party, and that if Kamrasi wished me to fight his battles, he must send fifty men to carry me to his camp, as I was too ill to walk; we might then come to some understanding as to the proposed

alliance. This bait took, and after some days I was carried to his camp and well supplied with provisions.

A few nights after my arrival there was a sudden uproar in the camp—hundreds of war-drums beating, horns blowing, and a mass of people dressed for battle, with horns upon their heads, and false beards; crowds rushed to and fro in the darkness, screaming and dancing with their spears, in the utmost confusion. Suddenly the king arrived in my hut, with a piece of blue baize tied round his loins like a kilt. This baize had been given him by Speke, and he confessed that he was thus lightly clad to enable him to *run away* quickly. It appeared that 150 of the trader Debono's scoundrels, armed with guns, had allied themselves to Fowooka, and, having crossed the river, were within 10 miles of our camp, together with several thousand natives marching against Kamrasi. I never saw any man in such a pitiable fright as the King. I hoisted the English ensign upon my flag-staff opposite my hut, and assured him that no harm should befall him if he would trust to its protection; at the same time I sent five of my men to summon the captain of Debono's party to appear. The men returned on the following day with ten men of Debono's, who candidly confessed their intention of killing Kamrasi and of capturing slaves. I declared the country to be under the protection of the British flag, and that I would hang the leader at Khartúm should one slave or head of cattle be stolen from Kamrasi's country. I gave them twelve hours to recross the river to the north side.

Curious to say, they submitted unconditionally; but, determined not to return without some booty, they actually attacked and plundered their own allies, after retreating across the river. This affair gave me immense influence with Kamrasi, but it did me much harm. I was so valuable to him that he would not allow me to leave his country. The season for the annual boats to depart from Gondokoro was passed, and I was a prisoner for twelve months until the following season. This was quite heartbreaking.

During this time M'tesa, the king of Uganda, had heard that I was on the way to visit him with presents, but that Kamrasi had detained me and received the presents intended for him; he therefore invaded Unyoro with a large army, and utterly devastated the country. Nothing would induce the coward Kamrasi to fight, and he took refuge on a river-island, forsaking me utterly, and not even supplying me with porters. I determined to push for Karuma and form a strong camp in the angle made by the bend of the river above the falls; but the enemy were on the road, we had no animals to ride, the oxen being all dead, and although weak and ill, my unfortunate wife and I

were obliged to make a forced march throughout the whole night, stealing through the high grass on the skirt of the enemy's camp.

Arrived at Karuma, I sent messengers to the traders who had accompanied me the previous year. They shortly arrived and received from Kamrasi an immense amount of ivory which I had arranged he should give them. M'tesa's army retreated at the approach of the Turks' party of 150 guns, and I left Kamrasi's country on my road home. He had stripped me of everything except my guns and ammunition, and his last request was that I would give him the English flag that had saved him from the Turks. I was obliged to explain to him that the talisman failed unless in the hands of an Englishman.

In passing through the Bari tribe, on my return to Gondokoro, we were twice attacked by the natives, who surrounded the camp and complimented us with a few showers of poisoned arrows. A good shot or two from the sentry settled the matter, and we arrived safe at Gondokoro—the exploration thus happily concluded.

I have now a task to perform which weighs heavily upon me—it is to deliver to the President of the Royal Geographical Society a map which was given to me by my lamented friend Captain Speke previous to his departure from Gondokoro. This map is the last relic that I possess of that great explorer, and I had fondly hoped to have delivered it into his own hand and to have publicly thanked him for the great service it has rendered me. Alas! instead of meeting him, I see a subscription list for a monument to his memory. He being gone, I feel the deepest satisfaction in being able to substantiate the main points of his discoveries. So vast is Central Africa, and so insurmountable are the difficulties of that savage country, that it is impossible for a single party to complete so great an exploration as the sources of the Nile. I can only pay a just tribute to the extraordinary perseverance and determination of Captains Speke and Grant in having overcome obstacles which none but an African explorer can appreciate. Not only have they laid down upon this map what they have actually seen, but I have determined the correctness of their information, gathered from the natives, respecting the course of the river from Karuma to the Albert Lake, and its subsequent exit from that lake on its course to the Mediterranean. To these great explorers belongs the honour of discovering the Victoria Nile-source.

For myself I claim no honour as the discoverer of a source, as I believe the mighty Nile may have a thousand sources. The birth-place of that great river is the vast rock-basin of the Albert Nyanza.

In those profound depths, bosomed in the mountain-range of

Photo

Equatorial Africa, in a region of ten months' rainfall, every drop of water, from the passing shower to the roaring mountain-torrent, is stored in that great reservoir of Nature. Fifteen hundred feet below the general level of the country, in a precipitous depression, lies the great reservoir of the Nile. So vast is its volume of water, that no single stream appears to influence its level. Even the great river from the Victoria Lake enters the great reservoir absorbed without a perceptible current.

I will not enter upon vain theories of a connection between this lake and the Tanganyika, nor indulge in any wild hypothesis that may mislead the public. I wish to lay before the world the simple and straightforward narrative of my expedition for the benefit of geographical science, trusting that nearly five years passed in toil and anxiety in Central Africa have been of service in determining the great Basin of the Nile.

THE PRESIDENT was sure that all he said in praise of his distinguished friend would be considered feeble, now that the Meeting had heard his simple tale of what he had accomplished. He perceived by the applause which they had awarded to Mr. Baker that they entered into the feelings which he had entertained for a long time in watching the progress of this remarkable man. And he knew that they would approve of the course taken by the Royal Geographical Society, which he was proud to have been the first to suggest,—that whilst Mr. Baker was engaged in his great work they awarded to him the Victoria Medal, in the belief that if he lost his life the medal would remain for ever with the family as a memorial of his great enterprise. In conversation with Mr. Baker, he had drawn from him several anecdotes some of which he was sure would have interested the Meeting if he had related them. He had told them how he had succeeded in overcoming the opposition of King Kamrasi, but he had not told them in what way he had done it. He had with him a Highland uniform, kilt, sporran, and all; and by putting on this dress, he so dazzled the barbarous monarch that he obtained all he wished. When Mr. Baker's book came to be published, he was sure they would say that he was worthy to be placed alongside the lamented Speke; and it was the delight of his heart that the observations of that great traveller to be correct. Many gentlemen present might wish to ask questions respecting the country, and he was sure Mr. Baker would be most happy to answer them. In the mean time they returned him their hearty thanks.

MR. GALTON said he wished to ask for a few additional particulars. First, in regard to the relative sizes of the river that runs into the Albert Nyanza and the river that runs out of it: by knowing this, a good idea might be obtained of the proportion of water afforded to the Nile by either lake. He should also be glad if Mr. Baker would give a somewhat fuller description of the general appearance of the extraordinary lake-basin of the Albert Nyanza,—whether there are boats on the water or ferries across it, and whether the shores are frowning shores like those of the Lake of Lucerne. The last question he would ask was with reference to such tribes as Speke and Grant had not made us acquainted with; further information on this subject was very desirable. No doubt, Mr. Baker had seen specimens of the tribes who lived on the opposite side of the Albert Nyanza; and it would be a matter of great ethnological interest to learn if they were materially different from the other tribes of which we have heard.

Mr. BAKER said Mr. Galton, as an old African traveller, must know how very difficult it is to form any opinion, without actually measuring a river and the force of its stream, as to the quantity of water which it may carry down in a given time. Especially difficult is it in the present instance, because the river is so full of obstructions in the shape of rocks that its capacity cannot be ascertained without elaborate measurements. Captain Speke made use of the expression with regard to the Nile near the junction of the Asua "a Highland stream." If anybody had seen the Tay at Dunkeld, they would obtain a fair idea of the river which flows into Lake Albert Nyanza. But as to the river which issues from the lake, it appeared to him from a distance as occupying a broad valley 4 or 5 miles in width. This width he imagined was continued for a great distance, because from an elevation of about 250 feet he could see to the horizon nothing but this broad valley of green reeds. When he said green reeds, they must fully understand the characteristic of the White Nile, which has a certain amount of clear channel, but a greater portion of its breadth concealed by reeds about 20 feet in height. Therefore it is a most difficult thing to form any idea of the volume of water that is carried down, three parts of it being concealed by vegetation. When he reached the Nile near the famous Miani's tree, he saw the river from an elevated ridge of nearly one thousand feet stretching away upwards towards the lake for a distance of 40 miles. It was so broad at this spot that with a heavy rifle he could not reach a group of elephants standing on an island in the middle of the stream. He estimated its width at a mile and a half. Lower down he found the river contracted to a width of 120 yards with a current of 10 miles an hour and a depth unknown. After leaving Khartúm, below the junction of the Blue Nile with the White Nile, the river passes through a gap between basalt hills, where with a pistol he could kill a goat across the river: it is, certainly, not more than 80 yards wide at that part, and the natives say there is a depth of 600 feet. This exemplifies how difficult it is, without actual measurement, to form any idea of the volume of water brought down by the stream. With regard to the general character of the lake, it is an abrupt depression 1470 ft. below the general level of the country. It gives the idea of a great volcanic gap produced by some convulsion of Nature, which has raised the mountains on each side and created a depression in their midst. This gap naturally forms a lake by receiving the drainage from a vast mountainous country. In many places the waves wash against the precipitous rocky shores which rise to the height of about 1500 feet above the level of the waters. The whole lake lies in a rocky basin; in fact, the hollow may be described as a huge cleft. On the other side of the lake rises a large chain of mountains whose bases he could not discern, as they were 50 or 60 miles distant; he could only see mountains apparently rising from the water. But at the exit of the river these mountains disappeared, giving rise to undulations like the Malvern Hills. Where the lake turns to the west, at its northern end, it occupies an apparent gap in those mountains; for, on the opposite side of the gap, is distinctly seen a continuation of the chain, which stretches as far as Gondokoro. Descending the Nile from Gondokoro there is no other mountain to be seen as far as Khartúm, a distance of 750 miles.

With regard to the tribes inhabiting the opposite shores of the lake—the Mallega, the M'Caroli, and the Koshi—the Koshi are a savage tribe, resembling the Madi. But the differences between the various tribes is not so much in physical conformation as in the mode of dressing the hair and ornamenting themselves. Many disfigure themselves by cutting holes in their lips and sticking straws in them. Others, again, will stick long pieces of crystal in the lower lip. Mallega is a very large country; much more powerful and of greater extent than Uganda and Unyoro: it is, however, perfectly unknown except to the traders of the country. The people of Mallega

have been known to cross the lake opposite to Vacovia in very large boats or canoes belonging to the King of Mallega. But the natives assured him that they seldom crossed, because it took four days' hard rowing to accomplish the distance. Taking 15 miles a day, that would give 60 miles as the breadth of the lake at that point. These people prepared skins most beautifully by rubbing them with the hand so that they become like chamois leather. Skins so prepared are of very great value, and find their way down to Karagwé. The natives of Karagwé are in the habit of sending boats across the lake for the purpose of getting skins, to purchase ivory. As to the characteristics of the Mallega people he could say nothing; the few individuals he saw appeared similar to the subjects of Kamrasi.

The PRESIDENT said, he wished to say, as a geologist, that Mr. Baker's discovery was a very remarkable one with respect to that science to which he had been so long attached. The Albert Nyanza, unlike the Victoria Nyanza, unlike the N'gami, and nearly all the lakes in the centre of Africa, which lie in depressions on plateaux with sedgy borders, is a deep rock-basin subtended by granitic and metamorphic rocks, and resembling, on a grander scale, the deep fresh-water basins of the North America. It was important to geologists to find that a deep and vast rocky basin of this nature exists under the Equator. Certainly, whatever theorists have written about ice excavating deep rock-basins, this is one of those cases in which ice-action is out of the question. He called attention to this, because that theory of ice-excavation had excited a great deal of discussion in other places. There was another point to which he wished to call attention. Mr. Baker had alluded to Miani's tree. This Venetian, M. Miani, had endeavoured to show that Speke had not seen the tree which he had marked with his name, and had maintained that he had penetrated a great deal farther south than Speke had given him credit for. He also described another river as being the main stream of the White Nile. Mr. Baker is able to assure us that the latitude given by Speke as the position of Miani's tree was perfectly correct, and that the point which the Venetian traveller attained lies much farther to the north than Miani had maintained it to be.

MR. BAKER said he had abstained from mentioning the name of Signor Miani, except casually, in the course of his observations. He made a point of saying as little as possible against any person, especially against any African traveller. It is generally supposed that we are apt to catch fever in Central Africa. There is another epidemic that travellers are liable to be seized with; and that is, disparagement of the labours of others. Therefore, he had not said in his paper what it was necessary now to say in answer to the President's remark. This was that he had taken especial pains to fix the position of Miani's tree, and had determined by observations that it stood in north latitude $3^{\circ} 32'$. From that tree Mr. Miani turned back, as the interpreter had informed him, because his stock of biscuits was consumed. He himself (Mr. Baker) happened to have the same interpreter who had accompanied Miani.

The PRESIDENT.—Is it not a matter of fact that Mr. Miani never got farther south than $3^{\circ} 32'$ north?

MR. BAKER.—Precisely so: $3^{\circ} 32'$ north.

Heights of Stations above the Mean Level of the Sea determined by Boiling-water Observations by S. W. BAKER, Esq., computed by E. DUNKIN, Esq., of Greenwich Observatory.

	Feet.
Tarrangollé	2047
Obbo	3480
Shoggo	3770
Asua River	2619
Shooa	3619
Rionga's Island	3685
Karuma, below falls	3737
„ „ south of falls	3796
South of Karuma, at river level	3794
M'rooli, river level, junction of Kafoor	3796
West of M'rooli, on road to Albert Lake	4291
Land above lake, east cliff	4117
Albert Nyanza, lake level	2448
Shooa Morru, island of Patocān	2918
Gondokoro	1636

The above heights will be found to differ considerably from those given by Mr. Baker in his letter, written from Khartúm in May last and published in the 'Times' newspaper in June. This arises from Mr. Baker having corrected his observations, whilst in the interior of Africa, from what have since proved erroneous data: the above are the correct computations of the same observations.

Remarks on the Thermometer B. W., used by Mr. S. W. Baker in determining Heights. By Staff-Commander C. GEORGE, Curator of Maps, Royal Geographical Society.

THIS thermometer was one of the three supplied by the Royal Geographical Society to Consul Petherick, in 1861, and was made by Mr. Casella.

At Gondokoro, in March, 1862, it was lent to Mr. Baker, who made all his observations with it and brought it back safe: it has, therefore, been in use about 4½ years.

On November 9th, 1865, Mr. Baker returned it to the Royal Geographical Society, and it was immediately taken to Mr. Casella, who tested its accuracy by trying its boiling point, in nearly the same manner as Mr. Baker had made his observations. The result by two independent observers was that the boiling point had increased in its reading by 0°·75 in 4½ years, or 0°·172 yearly.

On November 23rd the thermometer was again tested by Mr. Baker at the Kew Observatory. The observation was made under the same conditions as those near the Albert Nyanza as nearly as it was possible to make it.* The result gave the thermometer 0°·80 too much at the boiling-point.

The readings of the thermometer have, therefore, been *too much*, and by *reducing* the readings, it *elevates* all positions at which observations were made.

Table No. 1.—In this Table the error obtained at Kew Observatory has been treated like that of a chronometer, the error being assumed increasing and regular.

Table No. 2 is to correct the height, computed by Mr. Dunkin, using the quantity taken from No. 1 Table.

Table No. 3 is the final result of the observations for height, corrected for instrumental error.

* By immersion in boiling water.

TABLE No. 1.—Table for Increased Reading of Thermometer, using 0°-80 as the Result of Observations for its Error.

Month.	1861.	1862.	1863.	1864.	1865.
January .. ..	..	0°143	0°314	0°487	0°659
February .. ..	..	°157	°328	°501	°673
March	0°000	°172	°344	°516	°688
April	°014	°186	°358	°530	°702
May	°028	°200	°372	°544	°716
June	°043	°214	°387	°559	°730
July	°057	°228	°401	°573	°744
August	°071	°243	°415	°587	°758
September	°086	°257	°430	°602	°772
October	°100	°271	°444	°616	°786
November	°114	°285	°458	°630	0°800
December	0°129	0°300	0°473	0°645	..

TABLE No. 2.—At the elevation of 3500 feet, 1° equals about 520 feet, from which the following Table :—

°	Feet.	°	Feet.	°	Feet.
1°0	520	°7	364	°3	156
°9	468	°6	312	°25	130
°8	416	°5	260	°2	104
°75	390	°4	208	°1	52

TABLE No. 3.

Date.	Name of Place.	Approximate Position.		Reading of Thermo- meter, B. P.	Tempe- rature.	Height.			
		Latitude.	Longitude.			Baker.	Dunkin.	Kew Correction.	Result.
April 13, 1863	Tarrangollé (Latooka)	0 1	0 1	0		feet.	feet.	feet.	feet.
May 6 "	Obbo (camp)	4 30 N.	32 55 E.	203.5	89	2003	2047	189	2236
" 12 "	Shoggo (Farajoke)	4 02 "	32 31 "	206.0	76	3365	3480	194	3674
Jan. 12, 1864	Asua River	3 32 "	32 32 "	205.5	75	3643	3770	196	3966
" 15 "	Shooa	3 12 "	32 11 "	207.5	82	2543	2619	256	2875
" 22 "	Rionga's Island, 80 feet above river	3 4 "	32 4 "	205.8	82	3522	3619	258	3877
" 25 "	Karuma, below falls (Atada)	2 18 "	32 9 "	205.7	84	3400	3685	259	3864
" 31 "	" south of falls, on road to M'rooli	2 15 "	32 26 "	205.6	82	3637	3737	259	3996
" 31 "	" south of, at river level	2 10 "	32 29 "	205.5	84	3708	3796	260	4056
Feb. 21 "	M'rooli, river level junction of Kasoor	1 53 "	32 26 "	205.4	84	3766	3794	260	4054
" 21 "	West of M'rooli, on road to Albert Lake	1 38 "	32 20 "	205.5	82	3695	3796	265	4061
" 9 "	Land above lake, forming east cliff	1 13 "	31 24 "	204.5	80	4254	4291	271	4562
" 12 "	Albert Nyanza, lake level	1 15 "	30 51 "	204.8	80	4085	4117	271	4388
" 14 "	Shooa Morru (Island Patoan)	1 14 "	30 50 "	207.8	84	2388	2448	272	2720
April 7 "	Gondokoro*	2 16 "	31 55 "	207.0	84	2843	2918	277	3195
Mar. 21, 1865		4 54 "	31 46 "	209.2	86	1592	1636	363	1999

* Dr. Beke, in the 'Sources of the Nile,' published in 1860, from page 30 to 36, investigates the levels of the Nile from Cairo to Gondokoro; at page 36 he makes the latter place 1911 feet above the level of the sea—a remarkable confirmation of the above.

ADDITIONAL NOTICE.

(Printed by order of Council.)

Letter from the Baron Von der Decken to Sir Roderick I. Murchison, announcing the departure of his new Expedition into the Interior of Eastern Africa.

MY DEAR SIR,

Thula Harbour, 21st June, 1865.

After nearly seven months of tedious preparation we have at last finished our work, and are now under way. My original intention was to try again the Ozy and Dana Rivers, and after that, to turn to the North and visit every river, obtaining thus an idea of the hydrography of the East Coast north of Zanzibar. But I had to alter my plans, not being able to hire or buy a small vessel to bring up a supply of coals to the mouth of one of these rivers, and directed my course straight to Thula, 1° s. lat., where I had previously sent a stock of coals. There are two rivers here, the Thula and the Shamba, both of which I shall examine, and when I have finished I shall proceed to ascend the Jub. Whether these two rivers are really fresh-water streams, or merely long creeks extending 20 miles or more inland, I do not yet know, as the people on the island here are too much afraid to go over to the mainland occupied by the Gallas. I start myself for the Thula River with three white and four black companions, in my steam-launch, and will try to get up as high as possible, so as to ascertain if it be worth while to ascend in the larger steamer. If the result be unfavourable, I shall do the same with the Shamba, and if there is also no chance there, I start off to the Jub, although the bar of the Jub is very dangerous at this time of the year.

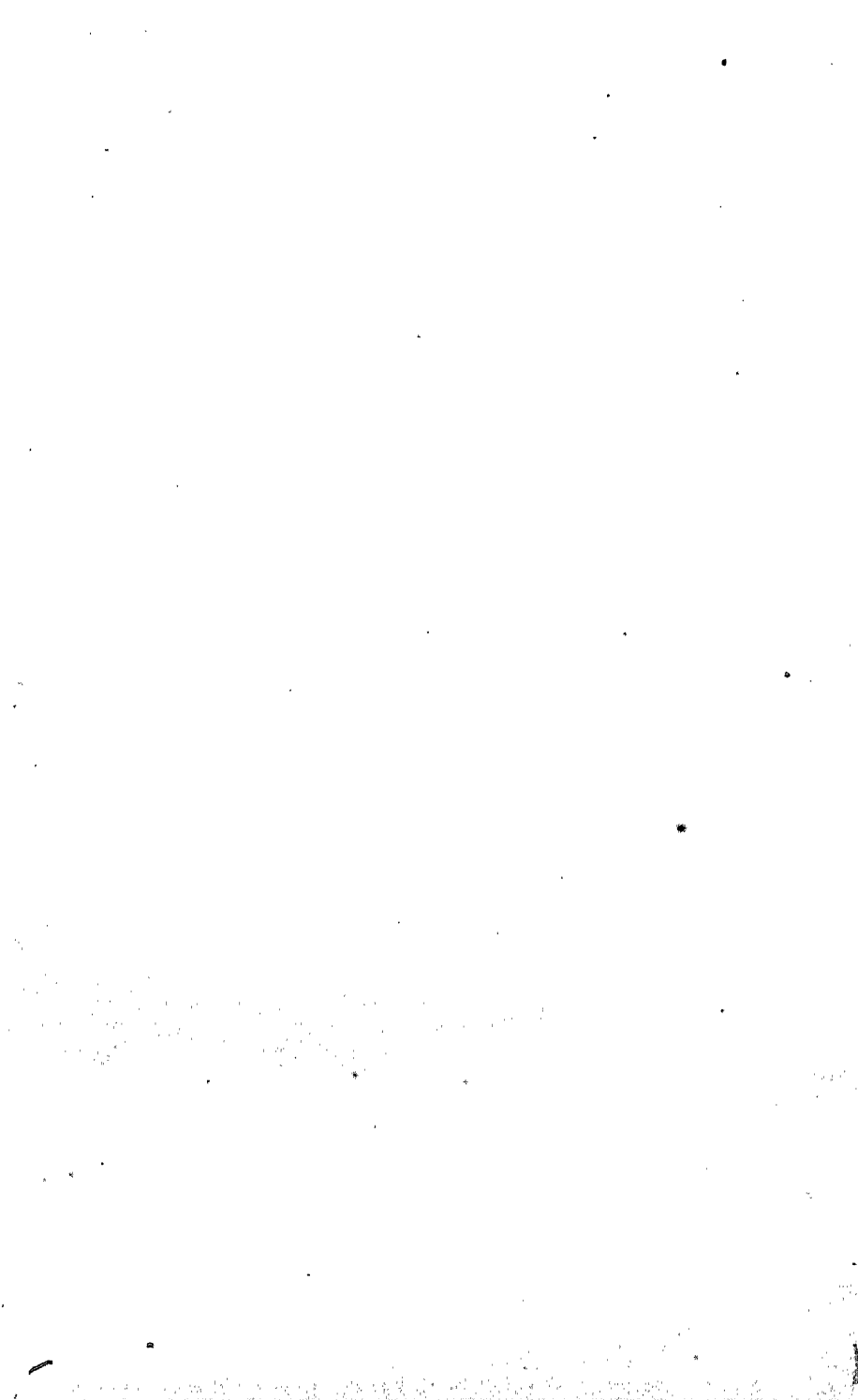
Captain Parr, of H.M. ship *Lyra*, who had previously done me the kindness of giving me a passage from Seychelles to Zanzibar, accompanied me, taking my little steamer in tow. It took us five days to reach this place, including a stoppage of two and a half days at Lamoo. During the whole time Captain Parr showed the greatest interest in my expedition, and did everything to be useful to me. Our passage was not a very nice one, the sea being very high and the wind rather fresh, but the *Welf* behaved splendidly and made no water at all, thanks to the care which Lieutenant Knight had taken in overlooking the work when the steamer was put together. The members of the expedition are all in good health; except a few slight cases of fever, we have had no sickness. I have with me ten Europeans (including myself) and thirty-two black fellows, two of whom were Speke's men. It is heavy work getting along with them: but patience and firmness will, I hope, triumph at last over obstinacy and indolence. I shall not take more than fifteen or twenty men with me on the land journey, for I shall make my luggage as light as possible, and hire porters, if necessary, on my way. I have always found that it is the best to live like the natives of the country one travels in and leave all European comforts behind. My companions will find it rather hard work, but they must bear it as I shall be obliged to do.

If an opportunity occurs to send you a letter, I will let you know the results

of my examination of the Thula and Shamba ; if not, I hope that one of Her Majesty's cruisers may call at Juba if they are anywhere near this part of the coast. I will send a letter to the senior officer of the station, asking him to give an order to do so, if possible.

C. VON DER DECKEN.

[News has subsequently been received of a series of disasters having happened to the Baron's expedition. His steam-vessels have been wrecked on the bar of the Jub, and sickness has disabled some of his party. No further communication direct from him has, however, at present reached the Society.]



PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

[ISSUED FEBRUARY 20TH, 1866.]

SESSION 1865-66.

Second Meeting, Nov. 27th, 1865.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATION.—*Alfred Davis, Esq.*

ELECTIONS.—*Lieut. the Hon. John Abercromby; John Bowring, Esq.; William T. H. Chambers, Esq.; R. C. Clipperton, Esq. (H.B.M.'s Consul at Kertch); Major Octavius Yorke Cocks; Binney J. Colvin, Esq.; Rev. Thomas Debary, M.A.; George T. Edwards, Esq., B.A.; Captain Thomas Fraser; Colonel John E. Gowen; Francis W. Grant (late Capt. 16th Lancers); Henry Hadley, Esq., M.D.; William Harrison, Esq.; Charles Hole, Esq.; Captain Thomas Hunt, R.H.A.; W. Hanks Lèvy, Esq.; Malcolm Mactaggart, Esq.; James MacDonald, Esq.; John L. Merivale, Esq.; Lt.-Colonel J. E. Michell, R.H.A.; Commander George Palmer, R.N.; Frederic Silva, Esq.; Captain F. N. Sullivan, R.N., C.B.; Hon. George Solomons; Rev. James H. Taylor; John Hemwood Thomas, Esq.; G. W. R. Walker, Esq.; Lieut. Arthur W. White, R.A.; Captain William M. Wolfe, R.A.*

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, NOV. 13TH, 1865.—‘Chinese Miscellanies: a Collection of Essays and Notes,’ by Sir J. F. Davis, Bart. ‘Notes on the Map of the Holy Land,’ by C. W. M. Van der Velde. ‘Notice Historique et Géographique sur l’État de la Question du Canal du Darien,’ par M. V. A. Malte-Brun. All presented by their respective authors. Continuations of ‘Journals,’ ‘Transactions,’ Periodicals, &c. &c.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING consist of 9 maps, on 17 sheets, and 122 sheets of the Ordnance Survey. Map of the Arctic and Antarctic Regions; Map of the North Pole, on star-like projection; Map of Spitzbergen; Map of Island

of Candia; by A. Petermann. A Chinese Map of China, by J. L. Southey, Esq. Geological Sketch of the Province of Wellington, New Zealand. Geological Sections of the Province of Wellington, New Zealand. Map of United States, on 3 sheets, by E. G. Ravenstein, Esq. 7 Maps of the River Nile, by Dr. Kiepert. Ordnance Maps, 122 in number, the Ordnance Survey Office.

The PRESIDENT said, before he called upon the Secretary to read the communications (which were exclusively upon Australia), it was his painful duty to announce the failure of two African expeditions, the success of which geographers had set their hearts. Those who attended the meetings of the Society would recollect that the greatest importance had been attached to an expedition fitted out by Baron Charles von der Decken, a Hanoverian nobleman, to explore the interior of Africa from the east coast, proceeding from Zanzibar and ascending one of the rivers of that coast. For this purpose he had fitted out two steamers entirely at his own expense, and provided the expedition with every sort of material to enable it to succeed. This was the same vigorous explorer who was the first to really settle that great question of a snowy mountain under the equator, the mountain of Kilimandjaro. The news which has just been communicated by Col. Playfair, our Consul at Zanzibar, now in England, was to the effect that the Baron had lost both his steamers on the bar of the River Jub; was nearly dead himself with cholera or dysentery; and that his party had been in collision with the natives. The other, but much more partial failure, was that of M. Du Chaillu, who had most nobly appropriated all the little fortune he had gained by the sale of his work to the fitting out of a fresh expedition. He had been in the first place delayed because his instruments were lost by the upsetting of a canoe; but he waited for fresh instruments, and in the mean time devoted himself to the collection of objects of natural history. After shipping these to England, and thus supplying the British Museum with numerous fine specimens of the gorilla and other animals, he at last proceeded upon his travels into the interior; and all that was heard of him was that he had penetrated into the Ashira country, and gone far beyond the point he attained during his former journey. He had undergone great difficulties, apparently; but nothing further had been communicated until the receipt of a telegram on Saturday evening last from Dartmouth, in these words: "Obliged to fight my way back to the coast; wounded twice; astronomical observations and journals saved; will be in town on Monday." Notwithstanding this calamitous result, he (the President) was very happy to find that the conclusion of the telegram assured us that this adventurous explorer had preserved his observations, which would undoubtedly be of great value, and the Society would hope to hear shortly from his own lips, at one of its meetings, the knowledge he had obtained in this expedition.

The following Papers were read—

1. *An Overland Expedition from Port Denison, Queensland, to Cape York, under the command of Messrs. F. and A. Jardine.* By Mr. RICHARDSON, Surveyor to the Expedition.

(Communicated by SIR GEORGE BOWEN, Governor of Queensland, through the COLONIAL OFFICE.)

THIS was an account of a remarkable journey undertaken for the purpose of discovering a route whereby live stock could be

taken by land from the interior Queensland pastures to supply the new settlement of Somerset, at Cape York. As the country to be travelled over, namely, the central and western portions of Cape York peninsula, was totally unexplored, a surveyor, Mr. Richardson, was attached to the party; and this gentleman, besides writing the account of the journey, had furnished a minute and elaborate map of the route, which was exhibited to the meeting. The party left Rockhampton on 14th of May, 1864, and reached Somerset on the 11th of March, 1865. In the months of October and November they traversed the country watered by the rivers Lynd and Mitchell, of which they report very unfavourably. Further to the north most of their horses died, apparently from eating a poisonous herb: death was preceded by excessive sweating, blindness, and contraction of the stomach. On leaving the west coast of the Gulf in January (lat. 14° s.), and striking eastward, good pastoral country was discovered—a great relief from the wretched region they had traversed since leaving the banks of the Lynd. Numerous creeks were crossed, the intervening spaces covered with long, coarse, dense grasses and sweet-smelling herbs. On the 24th of January they discovered a new river flowing westward into the Gulf, which they named the Jardine. The site of the town of Somerset is said by the explorers to be admirably selected, on the south-west side of the channel (800 yards wide) which separates the mainland from Albany Island.

This paper will be printed *in extenso* in 'Journal,' vol. xxxvi., with a map of the route.

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2. *On the Establishment of a New Settlement, Cardwell, in Rockingham Bay, and the Discovery of a Route over the Coast Range to the Valley of Lagoons.* By GEORGE ELPHINSTONE DALRYMPLE, Esq.

(Communicated by SIR GEORGE BOWEN, Governor of Queensland.)

THE new settlement (Cardwell), promoted by Sir G. Bowen, Governor of Queensland, was founded in the month of January, 1864, by Mr. Dalrymple and his party, on the site previously marked out by Captain G. H. Richards, R.N., in Rockingham Bay. The shores of the bay—in the tropical parts of Queensland—are described as mountainous, together with the islands of various sizes which lie off its entrance. The mountains rise to the height of 3500 to 4000 feet, and their slopes and the plains at their feet are clothed with a dense and luxuriant tropical vegetation, resembling the most picturesque parts of Ceylon. The pastoral districts of this part of Queensland, to which Rockingham Bay should naturally serve as

an outlet, lie on the table-land and in the elevated valleys beyond these precipitous ranges; it was, therefore, a vital object with the new settlers to discover a route capable of being made into a dray-road between the uplands and the port. An attempt had been made the previous year, by Mr. Dalrymple and Mr. A. J. Scott, to reach the coast from the interior, but it had failed, owing to the density of the forest and the steepness of the ravines in the mountains. Mr. Dalrymple, after establishing the colonists near Point Hecate, proceeded, with a party of troopers and natives, to make another attempt from the port, directing his course towards a gap in the wall-like range. He found that here the ridge was surmountable, and on the opposite side discovered a river, which he named the Herbert, flowing from the table-lands through a fertile valley to the coast, leaping into the plains beneath in a magnificent cascade. Reaching the cattle stations in the Valley of Lagoons, he returned to the settlement, and invited all the men to assist in making a road fit for wheeled vehicles. This was eventually accomplished. The distance by the road is 96 miles, and this road now connects all the interior country, and the banks of the Flinders, Lynd, and Burdekin, with the shores of the Pacific.

This communication will be printed entire in the 'Journal,' vol. xxxv.

3: *Boat Voyage from Adam Bay to Champion Bay, along the North and West Coasts of Australia.* By J. P. Srow, Esq., J.P., Adelaide.

My last letter closed on the 5th of May, and I fear its contents were anything but cheering to those interested in the Northern Territory. I am able now to give you news of the party, of whom I was one, that sailed from Adam Bay in the *Forlorn Hope*. On the departure of the *Bengal*, about fifty persons were left in the settlement. Of these, about forty were intending to leave by the first opportunity. It was well known that the time elapsing before the next advices from Adelaide would be wasted. The universal depression occasioned by the disappointed hopes and dreary prospects of the settlers and members of the expedition was relieved by the excitement of the two days on which the *Forlorn Hope* left the Cliffs and the Narrows. The main object of most of the members of the crew of this little craft was, of course, to return to Adelaide; but several, including myself, wished to visit different parts of the coast of our own territory. After this was effected, we were to proceed to Camden Harbour, and if a vessel was there bound for Swan River, Melbourne, or Adelaide, to sail by her; if not, to continue coasting till we fell

in with a vessel, or reached Fremantle, when the voyage of our boat was to end. We thought we should meet with numerous places of shelter about the coast and among the islands, but found, to our cost, how little we knew of the character of both. A few, and among them sailors, prognosticated a fatal issue to our voyage; but the unutterable disgust with which we contemplated the prospect of months of forced inactivity, determined us to venture. We purchased the boat on the 4th from the *Bengal*, and brought her on shore. She was 23½ feet in length, 6 feet across the beam, and 2 feet deep. She had two masts and spritsails, to which we added a jib. On the 5th we had washboards added to her, and a little decking and tarpaulin on the bows and stern, thus guarding as far as possible against shipping water, and at the same time making lockers for our provisions. On the 6th, after the departure of the *Bengal*, we got our luggage and provisions on board. We had 200 lbs. of bread and biscuit, some cheese, 20 6-lb. tins of beef, a few medical comforts, some cakes, about 70 gallons of water, and some firewood. We carried as little luggage as possible, and a chest with photographic apparatus belonging to Messrs. Hamilton and Hake.

In the course of the afternoon all preparations were completed, and the people of Adam Bay collected to bid us farewell. At 10 A.M. on the 7th we went on board, and I may as well give here the passenger-list:—J. P. Stow, Arthur Hamilton, and Wm. McMinn (surveyors), John White and James Davis (seamen), and Chas. Hake and Francis Edwards, men of the survey parties. Messrs. Hamilton and McMinn were to determine our course, and John White, an experienced boatman, who had been in the pilot service in Victoria, and was well-known at Port Adelaide, was to have the management of the boat. Francis Davis was also an able seaman. We had maps from Melbourne, tracings from the charts of the captain of the *Bengal*, two sextants, and several pocket compasses. We took leave of our fellow-victims on the banks of the Adelaide, and on pushing off were encouraged on our way by great and continued cheering, while parting volleys were fired from carbines and revolvers. Some of the camp, including G. McMinn, C. Hulls, W. Stow, and others, accompanied us for some distance in a dingy. They hoisted a blanket for a sail, but not being able to steer very close to the wind, we took them in tow, and sailed down the river against the tide, through the mouth, and for some miles towards Point Charles, across the bay, leaving the Beatrice and the Cliffs far to the right. Soon we approached the open sea, and it was necessary for the dingy to return. What a parting that was on the waters of Adam Bay between friends and brothers!—some embarked on an adventure full of novelty, and

not destitute of peril; others doomed to months of weariness and monotony.

We passed the Vernon Islands early in the afternoon, taking the inner channel, and going over shoals. Good winds most of the day. After sundown weather looked threatening, and we had a stiff breeze; but about 7 P.M. the weather cleared, and the wind abated. We had pleasant breezes most of the night. How beautiful when the moon rose, and spread its silvery light upon the calm water. We became sentimental. The everlasting ocean could never really become monotonous; one could never tire of gazing upon its broad expanse and watching it in its various moods. Waking and sleeping, in dreams and reverie, the first night passed away.

At daylight on the 8th we saw the mainland, and during the day sailed over a reef marked on our chart, and passed the entrance of Port Paterson, coast low and dreary. Native fires all along the coast. At about 8 P.M. were stopped by reefs, and turned to the west, when we were again stopped and anchored. At 1 A.M. on the 9th, at low water, found ourselves surrounded by reefs, and were thankful for our escape from shipwreck. At high-water the reefs were all out of sight, and we sailed pleasantly enough for three or four hours, when the wind shifted, and we went to seaward till the sea became so rough that we tacked to the east and ran in shore, anchoring about 11 A.M., two miles from a sandy beach, free from breakers. Heavy rain and wind. Remained at anchor till the morning of the 10th. We had a rough sea and high wind with a good deal of rain. We were saturated with rain and spray, and some of our bread was injured. An uncomfortable night, but all slept a good deal—some soundly. At 7:30 steered for the mainland. At 3:30 Cape Blaze bore s.w., distant about 8 miles, and a fine range of hills—I should say 40 miles distant s.e. $\frac{1}{2}$ e. Sailing very near the coast. Plenty of fish, and among them kangaroo fish, so called from the fact that they leap along the surface of the water on their tails. Heard snipe and plover on shore; sandflies visited us from the land. At 5 P.M. sighted the peak of Peron Island. The sea became rough, and not knowing the passage into Anson Bay, where we intended to call, we made for the shore, and anchored at 10 P.M., about 2 miles from the land, in 6 fathoms water. During the night the wind was cold and violent, with a rough sea. Our anchor being light, we drifted 8 or 10 miles to the north-west. At sunrise, on the 11th, we were out of sight of Peron Island, but we soon sighted it. The peak of the island first becomes visible, appearing like a solitary rock, but soon the rest of the island shows itself, and afterwards the smaller island. Winds light and variable, some-

times dying away altogether. There being a dead calm, anchored about 8 p.m. Numerous fires on the island and along the coast. Heard natives cooeing and wild dogs howling.

On the 16th, shortly after daylight, saw the Barthelemy Hills. Calms and light winds all day till about 4-30 p.m. Steered for what looked like an opening in the bight, between Cape Dombey and Cape Hay. On approaching, found this appearance of an opening which we hoped would prove to be a river, was occasioned by a break in the line of bushes that grow along the coast. This spot is left blank in the Admiralty charts. About dark, we anchored in $1\frac{1}{2}$ fathoms at the sandy beach. There was a large mangrove creek close to us on our right. Just before dark, saw large flights of cockatoos. During the night heard birds and the howl of the dingo on shore. Mosquitos troublesome the early part of the night, but they died or became torpid as the cold increased.

17th.—At sunrise noticed other mangrove creeks in the distance on each side of us. Landed, walking through soft mud, and afterwards got the boat on hard sand. Numerous tracks of natives and dingoes on the beach. At breakfast a dingo made its appearance, and we thought of shooting it, till it was suggested that it belonged to the natives. It made cautious approaches, now and then lying down, and watching us. It had a cord round its neck. It took no notice of the report of firearms. At last it sniffed food, and its advance became very rapid till we threw it some meat. After tasting this it ate out of a plate and then from our hands, and finally showed its gratitude and the delicacy of its habits by cleaning all our dishes and cooking utensils, and remained at our fire all day. At about 8 a.m. Mr. McMinn, White, Davis, and I started for the south point of the range south of the Barthelmys. We steered east, and at starting crossed and rounded a number of salt creeks, about which were numerous tracks of natives. We saw fishing-weirs across the creeks, with small openings, and near them mattings or nets with which, we suppose, the natives closed them as they wished. After getting clear of the creeks and mangroves we came to a hard plain, with grass and rushes; the grass wiry, but better than we had seen on the coast before. Much of the plain had been burnt. Before us was the range trending from south to north, or north-west, the Barthelemy Hills to the north of the end of the range, and other hills beyond in the same direction. We had a beautiful south-east breeze; the day was mild, and altogether like a May day in South Australia. We walked on briskly, elated with the idea of soon being on high hills, and having a view of good country. About 2 miles from the sea we came to a fresh swamp, and walking through it

soon came to another, and then found the swamps continuous. We walked 2 miles through water, and then turned northward to some distant timber, hoping to find there dry land that would lead to the Barthelemy Hills, whence we hoped we could travel along the range and return by a different route. When we reached the first clump of timber we found it a mere island in the midst of the swamp. One of the party dropped into a hole up to his shoulders in mud and water, and was rapidly disappearing when he was pulled out. After this we found the water invariably deeper when we came to timber, which was principally paperbark. We waded through rushes and reeds or small bamboos till our party began to separate. We then went for a considerable distance through tall flags, several feet over our heads, till the water reached to our waists, and deepened so rapidly that in a few steps we should have been reduced to the necessity of swimming, so we reluctantly returned, seeing water in every direction. Logs were floating about, and leeches abounded. I have no doubt we were on the edges of a lake, and that the water we walked through contracted as the dry season advanced. We had a view of at least 100 square miles of swamp.

On the 18th, at daylight, out of sight of land, going across Cambridge Gulf, with a high sea. Rough all day.

19th.—About two hours before daylight saw land. Passed Cape Bernier, and sailed along the coast. About Cape Londonderry it is a fine bold coast—high cliffs, and sometimes ranges of hills coming to the water's edge, with mountainous country in the background. All on land looked dry, and had that desolate appearance which the Australian coast generally wears in the summer season. Passed Cape Bougainville, and in the evening, as the navigation looked dangerous from the number of islands and breakers, we tried to find shelter under an island about 12 miles from the cape, but got on a reef with less than three feet of water on it. As we were endeavouring to get clear of this danger a heavy breaker came rolling on. The boat answered her helm beautifully, went head on, and rode buoyantly over the surf. We then headreached north-east, keeping a watch. After standing out for some miles the water suddenly became smooth, and we struck on rock. Soon after we saw breakers all around and land at no great distance. Bump, bump, grind, grind, went our poor boat on the rocks; we tried hard to get her off, but she continued to catch on the reef. Our situation was now critical. We were a dozen miles from the mainland, with no chance of escape in case of shipwreck, which seemed inevitable, for the soft wood of which our little vessel was made could not long stand such severe usage. We believed our voyage of life was about to end with that

of the *Forlorn Hope*, and it seemed that the motto on our flag would have a mournful significance. At last we got clear, and sailed back towards the island we had left in the evening, and anchored in 2 fathoms.

20th.—A heavy sea broke our rudder this morning, and we anchored and repaired it. Sailed in various directions, trying to avoid the numerous reefs and shoals, till at last we resolved to go eastward till we got outside them, and then still work round all these dangers—making a detour of 80 or 90 miles. The wind being against us, we ran down to the eastern side of Vansittart Bay, and found safe anchorage off a sandspit, at 5 fathoms, about half a mile from the land.

21st.—Got under sail at daylight; but as everything foretold rough weather we sought shelter, and anchored in 4 fathoms at Troughton Island, a quarter of a mile from the shore. We had a fine view from here. To the west, the cape—a round hill with a spit of land running out; to the south, the shores of Vansittart Bay, Troughton Island, curving round and partly obstructing the view; and behind all, in the distance, on the mainland, high ranges, and an immense quantity of smoke ascending from them.

22nd.—Started at daylight with a gentle breeze, smooth sea, and balmy weather, steering north till towards evening, when we ran west about 15 miles.

23rd.—After a fine night's run we struck at 3 A.M. on a reef. Got the boat off, and anchored till daylight in $7\frac{1}{2}$ fathoms water. At dawn were close to three remarkable rocks. All the forenoon among shoals and reefs. Tacked in all directions, and at length, to simplify matters, sailed over a shoal. Rowed a great deal. Plenty of turtles and fish about. Heavy dews at night. Quantities of porpoises. General course south-west.

24th.—Passed islands marked on the charts as south of Casini Islands. Passing islands all day.

On the 25th and 26th still islands, islands, islands. After leaving Cape Bougainville we passed at least 500, of every shape, size, and appearance. Some are several miles in extent; others are mere detached rocks; some have stunted vegetation; others look quite bare; some look like detached portions of hilly ranges; some conical; some round or oval, and flat-topped; some slope to the water's edge; some are bold and cliffy; some smooth; some diversified with sand-hills; some are rugged and uneven, with large rocks piled together in a wild and fantastic manner; some exhibit a sandy beach; others are guarded by barriers of reefs. Infinitely varied as these islands are—wild and picturesque, grand sometimes almost to sublimity—

there is about them all an air of dreariness and gloom. No sign of life appears on their surface; scarcely even a sea bird hovers on their shores. They seem abandoned by nature to complete and everlasting desolation. The barrenness and silence were more depressing to us from the circumstances of our position. We had thought to find shelter among so many isles, safe anchorages, when the storms rose and the sea raged, but the islands were more inhospitable than the wide ocean. There was deep fathomless water up to their shores, except where we were on treacherous reefs. Whatever wind blow we were compelled to drift, and were often forced out of our way by furious currents and eddies. It was a relief from weariness, anxiety, and danger, when we escaped from this archipelago. We tried to get into Camden Harbour through Rogers's Straits, but failed, being puzzled by islands, and baffled by breakers and eddies.

On the 29th felt at daylight considerably uncomfortable. Our provisions were out; we had been trying to catch fish, but although there were shoals they would not bite. There was no appearance of game on shore, and no sign of a settlement. The appearance and the bearings of the coast, islands, and channels were so utterly different from the description on any chart, that we had the greatest difficulty in determining which way to steer for the harbour, and some of our party became thoroughly sceptical as to its existence. At last we rowed through a narrow and tortuous passage between islands; and soon, to our great relief, we saw a boat in the distance. On coming alongside we found a surveyor (Mr. Cowle) and party. They had a remarkably dull and despondent look that rather surprised us, expecting to meet every one looking happy in so thriving a settlement as we supposed Camden Harbour to be. We soon heard the worst news. The sheep were nearly all dead, and the whole settlement was a failure. We remained five days at this unfortunate settlement, and gained ample information respecting its history, and the character of the land in its vicinity. The harbour is most beautiful. It stretches to the west for eight miles to where it is entered by three channels coming through reefs and islands. It is bounded on the south by the high rugged hills of the mainland; the loftiest eminence being Mount Lookover; on all sides are bights and inlets, while high round-topped islands complete the picture. The rise and fall of tide is $37\frac{1}{2}$ feet, and at low water islands and forests of mangroves are made visible that were out of sight a few hours before. The country was wild and rugged. Dark and irregularly-shaped hills that seemed to be composed of masses of loose rocks. Stones everywhere; but upon every spot of soft ground, and among the rocks, there was a luxuriant growth of rank grass.

Some of it was kangaroo-grass, but in quality utterly different from that of the southern colonies. Far away were bold mountains and ranges, and leading to them a succession of hill and valley, but all of the same stony character. The trees were scarce and stunted, the most remarkable being the Baobab, or gouty stemmed tree. The air during our stay was remarkably clear, and in the morning quite bracing. We visited the settlers, who were encamped about two miles from the Government camp. They were all ruined, and intending to leave by the first opportunity. They gave dreadful accounts of the weather at the time of their arrival. There had been several deaths from sunstroke: in one case a man was picked up dead in the bush; in another a settler, after spending a day on shore, returned to the vessel by which he had arrived, and expired in a few minutes. It must be remembered that in these cases of *coup de soleil* the parties had not landed many days, and probably did not take the precautions necessary to guard themselves from the effects of a vertical sun. The effect of the heat upon the sheep probably exceeded anything of the kind ever before witnessed. Their feet seemed burned with walking on the stones. All night they were in agony; their panting almost amounted to roaring. The extraordinary heat was probably increased to a great extent by the refraction from the rocks. At this time there was little grass; but when it did grow, and even after it had arrived at maturity, it was worthless. The few sheep that were left fed on it greedily till their stomachs were enormously distended, but they still fell off in condition. I saw the flocks at grass, and never, upon the worst run after the worst drought in South Australia, have I seen such wretched objects. They did not weigh more than 18 pounds, and the sight of one killed and dressed I shall not readily forget. The Government sheep, however, had not lost condition to any great extent, so that there was probably something in the management; but the fact that they had not improved was sufficient to condemn the country. The settlers' horses had to be fed with corn and bran, although they did no work and the grass was abundant. The Government horses were low in condition. They had done some exploring, but certainly in South Australia horses would do three times the work and look in fair order. A more unfit spot for stock of any description could not be found anywhere. There is probably good country inland, but too far off, and the route too impracticable for it to be connected with Camden Harbour. One settler found and took on lease a small piece of country with good grass and useful timber, eight miles from the camp, but such spots were very rare. The

whole scheme for settling Camden Harbour was rash and ill-considered.

Some few weeks before our arrival the settlement had been visited by Malays. There were about 300—in seven proas and 30 canoes. They were a wretched-looking lot, and for firearms had but a few old rusty flint-muskets and two or three small rusty cannon. The natives drove them away from the watering-places, and killed one of their number. These are the formidable pirates against whose attacks it was supposed the party at Adam Bay might have to maintain a desperate defence. At Port Essington the Malays were afraid of the natives, who were remarkably harmless.

On the 3rd June we took leave of our host, from whom we had received every assistance in preparing for the continuation of our voyage, and every attention to our comfort that courtesy and kind feeling could suggest. We took with us Her Majesty's mail and a multitude of messages to people in Perth. On leaving the landing at the camp we sailed over to the wreck of the *Cailliance*. Here several of the Victorian settlers who had purchased the wreck had their tents erected on the shore, and were busy in preparing to burn the hull as the only way to get the copper from her. We purchased a cable, and, soon after sailing, an enormous column of smoke arose from the wreck. The *Cailliance* was on fire as if in honour of our departure. Had that vessel been at Adam Bay a cutter would certainly have been made from her for the majority of the party to escape by.

On the 5th no land in sight.

On the 8th, about 4 A.M., the ironwork of our rudder broke; lowered sails, and put out a steer oar; sea high and rough. Sea moderated after noon, and we mended the rudder and baled out the boat. Some of the party unwell; two having cramps, another bilious, another with dysentery, and a fourth very sick, but ate very well. Wind variable, and high at night.

9th.—The sea getting worse till after daylight; a dreadful cross sea that our sailing master, White, said was enough to swamp all the boats that ever were made. At sunrise the sight was terribly grand—the long swell, the mountain wave, the deep hollow, the white foam—as far as we could see, the scene was one of wild disorder. When upon the crest of a mighty sea, we saw ourselves to descend into a deep hollow like the extinct crater of a volcano. Down we went, high seas foaming all around us. The bowsprit just kissed the water, and the *Folorn Hope* rose like a duck upon

the next wave. The storm did not increase after sunrise and at 10 A.M. showed signs of moderating, and before noon we had all canvas set. Latitude $17^{\circ} 14' 35''$; wind S.E. by S. Porpoises following us, and shoals of fish about. Yellow snakes with black spots floating on the surface; jelly-fish abundant. In the afternoon the wind rose till it increased to a gale. The sky had a hard, cold appearance. The waves awfully high, and we shipped some heavy seas; one in particular sunk the boat low, and we had to bale for our lives. We passed an awful night, expecting every minute to be our last. Half-drowned and bitterly cold; constantly baling; laying to with a leg-of-mutton sail.

10th.—At daylight the scene was frightful, and we longed for a ship to deliver us from our peril; but we knew that we were out of the track of all vessels. Snakes floating on the billows. About midday the storm showed signs of moderating, and we hoped to make sail again, but as evening came on the wind rose to a gale, and we found we had to pass another night of suffering and peril. One of the party was seized with shivering fits. We had no medicine, but administered rum and essence of ginger; rubbed his feet and covered him up in his bed; blankets, clothing, and everything saturated with water. Night clear, and the cold biting.

11th.—*Sunday*. We had passed through a night of tempest, danger, and pain; the storm worse than ever, the waves not higher, but we had cross seas, with the billows breaking over the boat and dashing her round. The invalid suffered very much, and—poor fellow!—we were unable to cook, or do anything for him but give him the rum and ginger. As the morning wore on, the tempest still raged. There was an awful feature in the storm that morning. The waves were high and steep, and as two of us sat watching the horrible scene, we saw an immense sea approaching almost perpendicular, and a few feet at the summit quite so, and of a bright green colour and capped with foam. "We shall never get over that," both exclaimed; but there is no craning at those fences, and on we went. As we expected, the top of the sea broke over the boat, nearly upsetting her, and dashed her down the steep descent, and the mass of water surging under dropped us down on the other side. "Bale, quick!" was the cry, and we prepared for the next sea. We had three of these walls of water, with their green tops and crests of foam; and it seemed a miracle how we escaped from such danger. Each time the boat was dashed down in the same way, and a quantity of water thrown into her. At noon we were once more deluded with the hope of the gale lessening, and we changed our leg-of-mutton sail into a double-reefed foresail. We took

latitude $17^{\circ} 86' 32''$. In the evening the sea and wind increased, and we were obliged to take in canvas. The waves broke against us from three different directions. We were now so exhausted that, although in such danger, we could sleep, and even the man at the helm kept continually dropping off and waking with a start. We were cramped and tortured with rheumatic pains, caused by being so long wet and remaining in the same posture. During the night we cut down the mainmast and let it float away; we could not unfasten it and take it down without moving about and probably upsetting the boat.

12th.—Morning broke upon us still battling with the storm. Awful as the danger was, there was a fierce and almost pleasing excitement in seeing the gallant way in which the *Forlorn Hope* rode over the mountain billows, or recovered herself after being dashed against by cross seas. During the day the storm abated. A few Boatswain-birds came round us. We ran all night under a close-reefed foresail.

13th.—Our situation still looked more hopeful, we could see over a greater expanse of wild sea and white surf. The breeze was strong, but we were getting under the influence of the land, and with a south-east wind the sea moderated fast as we approached the shore. We began to think that our worst danger was over, and to feel proportionately thankful. No men, probably, were ever in greater peril for so long a time. Fortunately we had moonlight—the sky, night and day, wearing a hard glaring appearance, with scarcely ever a sign of cloud.

14th.—About 10 A.M. saw smoke in the direction of land, and at 11.15 saw land itself. Latitude at noon, $19^{\circ} 45' 54''$. The coast low and barren-looking. Along the shore white sandhills with little vegetation. Endeavoured to land in the evening to dry our clothes, but there were heavy rollers that rendered it dangerous, so we stood out, and anchored in 4 fathoms.

19th.—Sighted Cape Lambert, which we reached about 2 P.M., and entered Nicol Bay, sailing between the mainland and Bezout Island. The coast bolder than any we had been accustomed to for some days. The hills appeared to have a good deal of ironstone about them. The rocks at the shore were rough and strange-looking—some washed into arches and concaves, others into the most rugged and fantastic forms, with multitudes of excrescences like stalactites. Patches of sandy beach appeared, and in places reefs jutted out from the shore. At 5 P.M. we were hugging the land on the south side of the bay. We sailed principally by solid rock of the colour for some distance of copper-ores. We almost fancied we could see the green and yellow carbonates. The land at the other side of

the bay plainly visible. Plenty of turtles. Jelly-fish of a peculiar shape, like mushrooms, with a horsetail attached. They were of different colours. Snakes following us. At about 4:30 heard a cooey, and saw natives on the summit of a rise. They motioned to us to come to them, and we steered towards the beach, but could not land on account of rocks and the swell. Tried to communicate with the natives, but we were unintelligible to each other. We were obliged to turn away, and when we did so they all gave a tremendous groan. There were about twenty men, women, and children. On our moving up the bay one ran along the top of a hill to watch our movements. About sundown we fancied we could see tents, and just after dark saw a light, when we cast anchor. Fired two barrels of a revolver and were answered by three distinct signal-lights, when we fired another barrel in reply, and rested satisfied we had found the settlers. Latitude at noon, $20^{\circ} 32' 6''$. During the night we began to doubt whether the settlement was not a native one.

20th.—At daylight all doubt as to whether we had found civilised beings was removed, for we heard a cooey, and immediately afterwards saw a native inviting us ashore. As however, the shore was some distance from us, and we had a fair wind, we pushed on, thinking the settlers must be higher up the bay, as we had seen no sign of a landing-place. We passed islands, rocky points, and long stretches of low shore fringed with mangroves.

On the 22nd, after going on shore in Nicol Bay, sailed at 2 A.M., and rounded point after point of the mainland, and an island running north of it, till a little before 8 A.M., close to the north point of the island, we saw a small sandy bight, and determined to land and get a view from the hills. On nearing the shore we saw a native, who ran along the beach, and then along the rocks, making great gesticulations. We spoke to him, and made signs that we were going to land, when he ran to meet us, and three or four other men made their appearance, with four boys. Two of the men had spears, and shook them at us; but as we approached nearer, they laid them on the beach. Not knowing how many might be in the background, we loaded all the firearms, and running the boat ashore, two of us landed, one having a revolver in his belt. The rest of the party stopped for some time in the boat. Eight natives met us, and were friendly enough. An old man kept in the distance, and did not come to us during the day. He was probably behind the times, and the slave of antiquated prejudices against foreigners. With this anticosmopolitan was a remarkably fine dingo, large, broadchested, and in good condition. We found the natives knew nothing of the settlement, but they had seen white people. They

used of their own accord about eight or ten English words, including water, baccy, sugar, by-and-by, and thank you. They begged for food, but that was too scarce with us at that time. We gave them knives and tobacco. They offered us fish ready cooked, but we were afraid they would expect us to pay for the meal with interest, or it would have been welcome. They appeared to have some notions of the habits of business men, for it was not till evening that they offered to introduce us to their families—an invitation the necessity of proceeding on our journey prevented us from accepting. They showed us water in the rocks nearly at the summit of the hills, about three-quarters of a mile from the boat. We took in a full supply in six journeys. The natives showed us some of their drawings on the rocks. There were sketches of fishes, turtles, lizards, and different kinds of birds, including emus. One native made a sketch of a turtle on the sand. If the performance would not have satisfied a critical eye, it had at any rate the merit of being dashed off with a free hand. One of our party then drew the outline of a horse, which sorely puzzled them. One of the men stood more than six feet, and most of them were above the medium height. All were badly shaped and skinny. In the evening we prepared to start, and not having been able to find any signs of a settlement, were determined to make for Champion Bay. We had about 60 lbs. of flour, 22 lbs. rice of the worst quality, and two or three pounds of oatmeal and maizena. We determined, after finishing the two latter articles, to put ourselves on three pints of flour and rice per diem for the whole of us. Having taking in wood and water, we went on board, and lay at anchor for the night.

23rd.—At daylight weighed anchor, and rounding a point steered w.s.w. for what appeared an opening ahead of us. After four or five miles got into shallow water— $1\frac{1}{2}$ to 2 fathoms. Passed several low, square, rocky islets, and a grassy island. Tried an opening to the north abreast of us. On reaching it found it very narrow—not above 20 yards wide. The current was very strong—at least eight miles an hour. Sometimes there were three fathoms of water, and then rocks three feet from the surface. We lowered sail on approaching, but the current was so powerful the only course was to go through the channel. We backed water with the oars, and shoved the boat off the rocks as she rushed through like a race-horse. We then found that instead of being in the open sea we were surrounded on all sides by islands and reefs, except to the east, the direction from which we came. We turned in that direction, and the wind being against us pulled till nearly midday, when we were past the last night's anchorage, and had a full view of our old

landing-place. Cooked oatmeal and flour. We lit the fire in a camp-oven, and boiled in a bucket. We boiled everything, to make it go further. About 1.30 took to the oars again, and continued pulling till after 4 P.M., when the wind enabled us to sail. At sunset there was a strong current against us, and we anchored between Legendre and Delambre Islands, in 11 fathoms water. Both islands are rocky but grassy on their surface. The passage between Legendre and Haay Islands appeared impracticable on account of breakers. A north-west breeze during the night made us anxious; we could not help thinking of the much dreaded North-west Cape, and feared the most dangerous wind had set in.

24th.—At daylight found to our joy that the wind had shifted to the S.E., and that we had probably taken leave of Nicol Bay with its dreary and desolate-looking scenery.

25th.—Glorious sunrise over clouds reflecting from their edges the most varied and brilliant hues. Light fleecy clouds in all parts of the sky, interspersed with others of a darker colour. Turtle about. Latitude at noon, $20^{\circ} 27'$. Rocky Point, Enderby Island, bearing S. by E.; wind, E.N.E. At sunset cloud-banks and dark scud all round. Winds light and variable all night.

26th.—Variable winds all the forenoon and ceasing altogether after midday till evening.

On the 29th, just after midnight, a fine breeze came from the S.E., and we had a splendid run all night. During the forenoon it shifted till it stopped at N.E. Course, S.W. At 11 A.M. passed a sandy island, S.E. by S. Immediately afterwards saw bottom; and sounded from $1\frac{1}{2}$ to 4 fathoms, and then passed into deep water. Abundance of turtle. Breakers to the S.E. A reef extends fully three miles N.E. from the island, which is seven or eight miles, according to the chart, from the Rossilly Island of the French. Latitude at noon, $21^{\circ} 19' 28''$. Breeze freshened till our juremast, made of an oar, cracked, and had to be stayed. At 1 P.M. Thouvenard Island on our port bow. During the afternoon passed a line of low sandy islands, keeping them to the east. About 10 P.M. saw a sandy island, unnamed. Shortened sail, so as to round the Cape in the morning. Pleasant night. Wind at midnight from S.E.

30th.—Cold towards morning. At daylight sighted Muiron Island, and passed between the island and Cape. Heavy breakers on the shore. Fine night. Passed Point Cloates at 11.30 P.M. Nearly drifted on a reef. All night heard the roar of the breakers.

July 1.—At daylight could see the spray rising up like mist-clouds. Latitude at noon, $23^{\circ} 8' 18''$. We had been running within from five to eight miles from the shore, and the coast from the North-west

Cape to this point was as wretched-looking as any part of the continent, barren, desolate, treeless, and of a dingy brown colour. I knew it was the season when in those latitudes Australian landscape would have a withered appearance, but here were large patches without any vegetation whatever. About that line of coast, there is no element of the sublime to redeem its horrible barrenness. A long range, of 600 feet elevation; no ruggedness, no beetling crag, no steep mountain or dark ravine, no chasm or overhanging precipice. The hills are smoothsided, with a dull uniformity of height, and appear to be elevated only to render more conspicuous their sterility and monotonous hideousness. Twenty-five miles from the cape the hills looked a little more irregular, but there was the same absence of forest, the same appearance of desolation.

2nd.—At daylight, could indistinctly see the coast through the haze and mist—to the north were perpendicular cliffs; to the south lower land, trending away in a kind of bight, and then coming out in the form of bold cliffs of reddish-white colour. Passed Cape Cuvier. The view was indistinct up to this point, but the land appeared desolate—partly cliffs, partly steep slopes, with sandhills here and there. Latitude at noon, $24^{\circ} 22'$. The wind was N.W. in the afternoon, and we steered for Shark's Bay, and ran under the shelter of the Bernier and Dorre Islands, the former of which we sighted between 3 and 4 P.M. Cold afternoon, and calm night.

3rd.—At daylight had passed Bernier Island, and had Dorre Island on our right—distant about 10 miles. Shores steep and cliffy, some of the cliffs being extremely white.

6th.—In the morning the sea was rather rough, with a long swell on. Dirk Hartog's Island had a mist over it all the forenoon. It is high land, appearing like ranges of hills, dark and gloomy. Occasionally we could see the steep cliffs overhanging the sea. About midday we were off the false entrance between the island and the mainland. Latitude at noon, $26^{\circ} 9' 45''$. The coast on the mainland is low, sandhills near the points, then low yellowish cliffs, their summits showing dry grass, but perfectly bare of timber. Snakes followed us, and albatrosses sailed round the boat. During the night weather alternately cloudy and fine; light winds most of the night.

7th.—Towards daylight the breeze freshened. About an hour before dawn took in the mainsail. Wind N.E., getting stronger during the forenoon, and the sea very rough. We had got out 20 miles from land, and the sea being on our broadside we received a good wetting. About 10 A.M. the weather moderated, and soon after the sun came out, and the sky lost its wintry appearance; even

the wind was warm. Latitude at noon, $27^{\circ} 18'$. In the afternoon wind N.W., and weather threatening. All longing to reach Champion Bay before a burster came on, we pulled in towards the coast, and ran within seven or eight miles of it. Land high, but the atmosphere was so hazy we could see little of it. Sometimes we saw cliffs, and timber in places. We saw smoke on shore, the first since leaving Exmouth Gulf. Plenty of albatrosses and a few cape pigeons. In the latter part of the afternoon the land became more distinct, and we could see the green foliage of trees. Passed Gantheaume Bay about 7-30. Although before moonrise could make it out distinctly. We had a splendid run during the night, hugging the shore, with a smart breeze and a high sea in our favour. After passing Gantheaume Bay the limestone hills were very conspicuous, and had a strange effect by the light of the clouded moon. They were lofty and white, with dark sunmits. Noticed Shoal Point. Passed, without observing them, Port Gregory and the mouth of the Hutt River. During the night the wind shifted once or twice, and on one occasion the jurnmast cracked, and nearly went over the side. Just afterwards an oar that was being used for a boom broke in half, striking the watch on the head, knocking him into the bottom of the boat, and occasioning a flow of the circulating fluid from the nasal organ.

8th.—Morning broke unpromisingly, with a mist so dense that we could not see the land at the distance of a quarter of a mile. We feared that in the fog we should pass Champion Bay without seeing it, but at last we recognized, in what looked like a cloud-bank, the high land; and, after a heavy shower of rain had to a great extent cleared away the mist, we were refreshed by a delightful view of lofty and picturesque ranges. We were prepared, from all we had heard of Western Australia, to find a barren coast; but we saw that whether this part of the coast were fertile or otherwise, it presented a bold and varied scenery. There were hill and valley, peak and bluff, long ranges, flat-topped hills, trees scattered over the upper portions of the elevations, and heather upon the mountain side. The effect of this view upon us, after the dreariness and desolation of the coast we had left behind, was enchanting. Then the mist came over us again, obscuring all the view, and leaving only the dull outline of the coast. Once more it partially cleared, and we saw in the distance Mount Fairfax and the Pinnacle, with other hills of strange shapes. Hugging the shore we passed over a shoal marked on the chart, with five fathoms of water on it, and a rough sea. Shortly after this we perceived a green spot in the scrub, then discovered a hut, and found that the verdant patch was a cultivation paddock.

How welcome was this first sign of civilization after 1600 miles of wild ocean and desert shore. The coast after this took a sweep, and we struck for a distant point of land with a reef stretching out from it. In vain endeavouring to reconcile our course with the chart, we suddenly saw houses, then flagstuffs, shipping and a jetty. At last our toils, privations, and perils were over. We turned our boat for the jetty, and disregarding the buoys to our left, sailed over the end of the reef, on the south-west side of the bay, with soundings at from $3\frac{1}{2}$ to 5 fathoms, till we got regular bottom at 6 fathoms, which lasted till we nearly reached the shore, when it shoaled suddenly. Our arrival created great excitement. It was at first thought that ours was a whaleboat from Port Gregory; but the course we steered, and the fact of our taking soundings, proved us to be strangers. Nearly all the population were on the beach to meet us, of course thinking we were part of a wrecked crew, and fifty willing hands helped to drag our boat on shore. Our story was soon told, and we were loaded with expressions of kindly welcome and offers of assistance; and, although undoubtedly we presented a suspicious appearance, the authorities did not trouble us with inquiries till we had been warmed by the fire and comforted with the good cheer of mine host Baston, whose excellent hotel we can recommend to travellers as one where they will meet with excellent accommodation and the most studied attention to their comfort. After satisfying the claims of hunger we proceeded, according to our several tastes, to give ourselves the appearance of civilized beings. Before the metamorphosis was completed in my case, I was waited upon by a functionary, who inquired if I was the ringleader of the party. I looked steadily at him, as if for an explanation, when he modified the expression by lopping off the first syllable, and dwelt upon the extreme importance of caution and vigilance in a convict colony. I satisfied him, however, by showing my clearance from Camden Harbour, and still further reassured his mind by allowing him to see Her Majesty's mail for Fremantle. The day continued rainy and cold, and rendered doubly grateful the warmth and shelter we had found after our weary voyage. In the evening several of us visited the Mechanics' Institute, and buried ourselves for hours among the colonial, but, of course, more particularly the Adelaide, journals. Those who in our own beautiful city have been accustomed to their morning and evening paper, will hardly appreciate the zest with which we devoured several months' news, with all their topics of interest, including the rise and fall of Ministries, the accidents by flood and field, the catastrophe that had befallen Panter's party, the deaths of great men in the old country, and the momentous news

from America. We returned very late to our inn, and felt thankful that the voyage of the *Forlorn Hope* had ceased. Our crew was disbanded. A better lot never pulled together. Under Providence we were all much indebted for our lives to the skill and judgment of John White, and to his coolness in times of the greatest possible danger; and we felt thankful we had the assistance of another British tar, James Davis. To my friends, Messrs. Hamilton and McMinn, who took observations and laid down our course, we owed the exactness with which we ascertained our position and pursued our way. To their assistance I owe much in preparing this journal, and to their labours is to be attributed the accuracy that must constitute its chief value. Those who were neither seamen nor navigators did their duty as Englishmen, and the recollections of the perils we have faced, and the hardships we have endured together, will form a tie that time can only strengthen.

The PRESIDENT, in inviting discussion upon the papers, made a few remarks on the wonderful and rapid progress which the new colony of Queensland had made under the skillful and energetic administration of Sir George Bowen. Further details of this progress, and especially of the extension of the frontiers of civilization towards the north, by the valleys of the Lynd and Flinders, were given in the communication of Sir George Bowen which accompanied Mr. Dalrymple's graphic and striking narrative, and this would be printed in the next volume of the Journal of the Society. The value of the map of the journey of the Messrs. Jardine was also dwelt upon by the PRESIDENT. The greater part of the route was entirely new, and it had been depicted on a large scale and with the greatest minuteness. With regard to the bold adventure of Mr. Stow and his companions, it seemed to be almost equal, as a boat voyage, to that of Lieutenant Bligh when sent adrift by the mutineers of the *Bounty*; but the adventure was a voluntary one, and all praise was due to Mr. Stow for endeavouring to add to our knowledge of the coast-country in the course of the journey.

Sir CHARLES NICHOLSON said, with regard to the first paper, which gave a detailed account of the journey of Messrs. Frank and Alexander Jardine, he might observe that these very enterprising and intelligent men were natives of the colony, sons of a very gallant and able man, who had been appointed commanding officer at Cape York. They were sent with horses and other articles to supply the new settlement, and certainly they acquitted themselves in a very successful manner. He had noticed that there appeared to be on the part of Anglo-Australians a sort of intuitive gift, by which they were enabled to carry out undertakings like these. He believed that the failure of many most enterprising individuals had arisen from the fact that they were not of this peculiar class. With regard to the second paper, giving the account of Mr. Dalrymple having succeeded in discovering and opening the new route from Rockingham Bay to the interior of the Valley of Lagoons it would be recollected that it had always been a matter of great difficulty to get over the extensive ranges of Eastern Australia running from north to south, and Mr. Dalrymple had rendered a great service to the colony of Queensland in surmounting the difficulty at a point where it was of so much importance. But he had perhaps rather over-rated the advantage to English colonists of the lowlands along the coast of Tropical Eastern Australia. The numerous lagous and long stretches of mangrove swamp, which occupied so great a part of the

area, detracted greatly from the value of these districts. He might remark that the settlement was going on with great rapidity in the north of the continent, and that it had been taken up almost as far as the Gulf of Carpentaria. He had been much struck with the account given of the utter desolation and lifeless character of the islands on the north-west, given by Mr. Stow, which contrasted so strongly with the beautiful islands of the north-eastern coast. Some years ago, when sailing along the coast, he thought he never saw anything so perfectly beautiful and so picturesque as the whole of the coast from Moreton Bay northwards. Referring to the general fact, that the only available portions of Tropical Australia were probably the eastern portions, and that the meridian of 135° pretty nearly marked a line between the fertile parts of the East destined to a prosperous future, and the probably useless and sterile country of the West, he thought it a pity that those enterprising and gallant men, who had explored from Adam Bay westward, did not direct their efforts to some locality further eastward, more likely to be productive of solid advantage. A short journey of 600 miles would have brought them to Cape York, and saved a good deal of their tedious voyage. There was one point which he would only just advert to, namely, the utter absurdity of the views which led to the establishment of a colony in North Australia, subject to and under the jurisdiction of South Australia. They had been the means of exciting angry feelings amongst the people, and producing disruption and disunion. He would mention that a very interesting communication had arrived by the last mail, to the effect that steam communication had been established between Brisbane and Singapore, and no doubt the first steamer of this important new line was now on her way, so that there would in future be monthly communication by Torres Straits with Australia, and the whole continent would be encircled. He might also mention, as a fact showing the increase of rapidity of communication, that this day (27th November) we were in the receipt of news by telegraph from Australia up to the 24th October, a little more than a month.

The PRESIDENT, in closing the proceedings, said it was necessary to call attention to a fact which people were apt to forget, that it was the discovery of the mouth of the Adelaide River, in Adam Bay, by Macdougall Stuart, on his journey across the continent, which led the South Australians, however imprudently, to send a colonising expedition all round the east coast to that remote northern point. He agreed with Sir Charles Nicholson that Mr. Stow and his party would have made a more easy voyage by steering their boat eastward in the direction of Cape York; but they had already taken that route in their voyage from Adelaide to Adam Bay, and they went, like true geographers, to explore new lands; and he therefore stood up for these spirited men, because he considered that a 1600-mile boat voyage round that country was a feat of which geographers ought to be proud.

Third Meeting, Monday, December 11th, 1865.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*J. Gwyn Jeffreys, Esq.; Binny J. Colvin, Esq.*

ELECTIONS.—*Samuel White Baker, Esq. (the discoverer of the Lake Albert Nyanza); Colonel William Edwyn Evans; John Howard Gwyther, Esq.; J. J. Halcombe, Esq.; Henri G. de Mussy, M.D.; H. J. Norman, Esq.; Oswald C. Papengouth, Esq., C.E.; Joseph Valentine Smedley, Esq., M.A.*

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, 27TH NOV., 1865. — ‘*Annuario corografico-amministrativo della Provincia di Siena.*’ Anno 1. ‘*Memoria sobre os Trabalhos geodesicos executados em Portugal.*’ 2 vols. Par F. Folque. Both presented by William Spottiswoode, Esq., M.A., F.R.S. ‘*Considérations générales sur l’Étude et les connoissances que demande la composition des Ouvrages de Géographie.*’ Par M. D’Anville. Presented by S. M. Drach, Esq. ‘*The Isthmus of Panama.*’ By C. T. Bidwell, Esq. Presented by the Author. Continuations of Periodicals, Transactions, &c.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING.—Map of Australia, showing the new boundary of Queensland and South Australia. Map of the White Nile, near Gondokoro, showing the last journey of Signor A. Debono in 1861. Presented by the Right Hon. H. W. Addington.

Previous to the reading of the Papers, the PRESIDENT said it would ill become him not to call attention to the great loss which science had sustained in the death of that distinguished geographer Dr. Henry Barth. The mission on which he was sent was originated and supported by this country; his explorations were, therefore, really and truly English, and he carried out his enterprise with the greatest fidelity, travelling over a large portion of Northern and Central Africa. Dr. Barth brought to his geographical investigations an energy and ability which ought to make his name long remembered amongst geographers. Little notice, he regretted to say, had as yet been taken by the English press of the decease of this distinguished man, whose works had been published in this country and who had been honoured by our own Sovereign with a Companionship of the Bath. He (the President) would not now enter more at large upon his merits, reserving that for the Anniversary Address. In his extensive travels Dr. Barth had to go from one zone of country peopled by Mahometans to another inhabited by Pagans, and showed his great qualities as a traveller by the way in which he overcame all the difficulties which obstructed each portion of his passage. His merits had been duly appreciated in Germany, particularly by our associate Dr. Petermann, and he (the President) was hopeful that the people of England would give in this case that credit to him which they were always ready to give to every eminent foreigner who did such good service.

* The President also announced to the Society that he had to modify (owing to more correct intelligence having been received) what he had said with regard to the expeditions on the east and west sides of Africa, to which he had alluded with a melancholy feeling at the last meeting. One of these expeditions had been to a great extent successful, and the other had met with no real reverse. The results of the expedition of M. du Chaillu would be communicated to the Society after Christmas. When he told them that M. du Chaillu had penetrated considerably beyond his former survey, that he had made many observations of great value which were now the subjects of calculation at Greenwich, that he had entered into rocky regions never before explored by a European, and that he had preserved all his notes and his valuable observations,—such results would be regarded as full compensation for what they were led in the first instance to believe had been a great misfortune.

In regard to the East Coast, he was happy to announce that the energetic

explorer Baron von der Decken had not lost both his steamers, as had been rumoured. It appeared that his small steamer was lost on the bar of the Jub, but that the other had been preserved and repaired. The party had advanced up that river to a considerable distance, and, when last heard of, were preparing to proceed on their land journey into the interior. They were in high spirits and in good health, and there was reason to hope that with so very enterprising a leader and so many appliances the expedition would be ultimately successful.

The following Papers were read :—

1. *A Boat-voyage along the Coast-lakes of East Madagascar.*

By CAPTAIN W. ROOKE, R.A.

CAPTAIN ROOKE related that having heard, whilst at Mauritius in 1864, that the chain of lakes south of Tamatave, in Madagascar, might be traversed for several hundred miles in a boat sufficiently light to be carried over the short portages, he determined to attempt their exploration. He had a boat constructed especially for the journey, and, with three companions and a native crew, started for the northern commencement of the lakes in the month of April. The whole journey from north to south occupied the party thirty-two days, during which they travelled nearly 400 miles, partly over lakes of larger or smaller dimensions, but chiefly along winding channels and streams which connected the lakes together. The chain of lakes and channels occupies a belt of low land along the coast, and is sometimes separated from the sea only by banks of sand. The large rivers which descend from the highlands of the interior are connected with the network on reaching the low belt of coast-land. During the journey the travellers passed numerous villages and several larger towns, each of about 1000 inhabitants; their voyage terminating at Manzanari. They were well received by the Hova governors; they saw very little cultivated land, and the inhabitants seemed an indolent and improvident, but good-humoured race. The banks of most of the winding channels and lakes were clothed with magnificent tropical vegetation, which in the narrow watercourses arched overhead and added much to the beauty of the scenery. At Manzanari they saw several individuals of the Akongo tribe, whose territory lies towards the south, and who have succeeded in maintaining their independence against the Hovas. Their capital is several days' journey south-west of Manzanari, and is situated on a high hill, the sides of which have been escarped for the purposes of defence.

This paper will be printed in the 'Journal,' vol. xxxvi.

2. *On Ankova, the Central Province of Madagascar, and on the Royal or Sacred Cities.* By the Rev. W. ELLIS, F.R.G.S.

THE author informed the Meeting that he had undertaken his recent (fourth) journey to Madagascar at the invitation of King Radama, towards the end of 1861, and that during his excursions in the interior in search of limestone for building, and for other objects, he had travelled over several parts of the province of Ankova. It is the most important of the twenty-two provinces into which the island is divided, from being the country of the Hovas or dominant race, and is 150 miles in length, by nearly 100 in breadth. The country is hilly or mountainous, but the elevations rise singly or in masses, rather than form continuous chains. Mount Ankaratra, in the south-west of Ankova, is one of the highest mountains in the island, supposed to be about 13,000 feet above the level of the sea. It had not yet been ascended by a European, and probably not by the natives, although they stated that in the cold season snow lay in the hollows near the summit. Between the isolated hills or mountain masses lay fertile valleys or level plains, some of them several miles in extent, frequently well irrigated and cultivated with rice. The province is well watered, and the rivers, though not large, seldom fail through the long droughts of summer. The author, after enumerating the streams, rivers, and lakes of Ankova, proceeded to describe the forests, which, with occasional intervals of clear land, bordered the province on three sides, and supplied it with valuable timber, but left the central district itself almost destitute of trees. Euphorbias and several kinds of *Ficus* were indigenous, and fruit-trees had been introduced, and grew luxuriantly. Horned cattle are numerous; and it is a singular fact that, whilst the domestic ox is the humped Indian species, the vast herds of wild cattle are all of the straight-backed kind. The sacred cities or villages of Ankova are twelve in number; they derive their sanctity from having been the birth-places, abodes, or burial-places of their monarchs. Europeans are forbidden to enter most of them; and although some of them are places of large size, they have not yet been laid down on our maps. Their names and relative situations are as follow:—1. Alasora, about 6 miles south-east of the capital. This is said to have been the first residence of the Hovas in Imerina. 2. Imerinmanjaka, 2 miles N. by E. of the capital. 3. Ambohitrahiby, place of first eating of beef, 12 miles north-west of the capital. 4. Antananarivo, the capital. 5. Ambohimanga, 10 miles N. by E. of the capital. This is the most sacred city in the province, it was the capital of the northern part of Imerina before

its chief conquered Antananarivo, and contains the house of one of the national idols Ifantaka (pronounced Ifantak). The sovereign visits it usually once a year to preside at, and take part in, the offerings and other rites in honour of their idol. It contains the tombs of several sovereigns, especially the mother of the late King, who was also the aunt of the present Queen. It is defended by fortifications, the s.e. angle of the mountains forming a steep escarpment. 6. Ambohitany, $2\frac{1}{2}$ miles distant from Ambohimanga, situated on an elevated ridge. In this place is the house of Ramahavaly, a more renowned idol than Ifantaka, whose will to punish any one is supposed to be accomplished by the agency of serpents. 7. Ambohidratrimo, 12 miles north-west of the capital, the birth-place of the mother of Radama I. 8. Ilafy, 5 miles N.N.E. of the capital, is the birth-place of the mother of the late Queen Ranavaloa, and belongs to Radama II., her son. 9. Inamehana, $5\frac{1}{2}$ or 6 miles N. by W. of the capital, belonging to the present Queen. 10. Ambatofimanjana, the exact position unknown to the author. 11. Ambohimananambola ("the village having silver or money"), 6 or 7 miles to the E. of the capital, containing the house of the chief national idol of the Ilovas, Ikolimalaza. 12. Ambohimimalaza, E.S.E., 10 miles distant. The belief in the influence of the spirits of the ancestors of their monarchs is one of the chief features of the Malagasy religion; it enters into all their most important ceremonies, and influences the actions and policy of royalty.

This paper will be printed in the 'Journal,' vol. xxxvi.

The PRESIDENT said he was quite sure the Society would return most hearty thanks to the authors of these papers,—the gallant young artillery officer Capt. Rooke and the celebrated missionary Ellis. With regard to Mr. Ellis, he had, in his modesty, not touched upon the great service which the body to which he belonged had rendered to Madagascar in introducing a written language amongst its people. He had not only communicated to the Society geographical information, but much ethnological knowledge. No doubt, on the present occasion, gentlemen would rather have heard a paper much more connected with pure geography; but ethnology was so closely interwoven with descriptions of distant countries that when there was any communication made relating to the habits and manners of people by those who had been careful to form a right judgment he was quite sure that such knowledge would always be gladly received.

Mr. J. CRAWFORD said he was very much obliged to his friend Mr. Ellis for the paper which he had read. Madagascar was a very large island,—the third, in point of size, in the whole world, being next to Borneo and New Guinea. It was about three times the size of our own island, and a great deal larger than the whole kingdom of France. It was big enough, if it were only good enough. The inhabitants were negroes, and though upon the whole they were more advanced in civilization than the negroes of the opposite continent, especially the eastern side of it, which was about the most inhospitable and barren country in the known globe, still they were sheer absolute barbarians, even in the favourable representation of Mr. Ellis. Now, something had been

said about oxen and the other animals. There were the ox, the goat, the hog, the dog; he was glad to think that the sheep was not a native of that country—glad on account of the sheep, for the climate was not suited to its health. There were wild and domestic cattle, but how brought there he could not tell. They were very numerous, and the Americans used to go there for the purpose of making jerked beef. There must have been at one time or another a communication between the Malay islands and Madagascar, and a very mysterious one, in proof of which he would give a few examples. There were many Malayan words in use by the Hovas, including the whole series of numerals up to 1000, or, including Sanskrit numerals in Malay, up to 10,000 and 100,000. He had selected a few of the words, to show under what obligations these negroes were to the Malayan people, who came, one hardly knew how, a distance of at least 3000 miles. It must have been much easier, however, to come than to return, because on the way there they were favoured all the while by either the south-east trade-wind or the south-east monsoon. To get back seemed to him a matter totally impossible, by a direct course. They had introduced such names as rice, cocoa-nut, capsicum, thread to sew with, iron, sea or land, as correlatives, island, headland or cape, and others, to the number of 150. The following names of places were also of Malay origin:—*Tanjuna amber* (Malay, *Tanjung amber*)—flat or insipid point or headland. *Manumbar* (Malay, *Mañumbar*)—to swoop as a bird. *Tanunarivo*—Name of the Madagascar capital in Malagasy, and meaning, in Malay, 1000 villages or towns. *Ranuwinta*, in Malay, Water needed or wanted. *Boyuna bay*—In Javanese the *Boya* signifies “danger,” and also an “alligator.” The syllable *na* is the preposition “of,” as in the word *tuna-na-rivo* above named. *Narendra*—The word *narendra* is Sanskrit, derived from the Javanese, and means “king” or “prince.” Such Malayan words as *Batu*, a rock; *Ranu*, water; *Tanjuna*, for *Tanjung*, a headland; and the sea is usually called *Ranawinta*, a compound Malayan word signifying “salt-water.” Then we have *Nasi*, for *nusa* in Javanese, an island; and *Lanitri* for *Langit*, the sky, in Malay.

The PRESIDENT said he thought when Mr. Ellis rose to reply he would show that the inhabitants were not quite such sheer barbarians as Mr. Crawford had described them to be. Their progress in architecture had surprised him; judging from the photographs of public buildings now exhibited.

LORD STRANGFORD observed that, as Mr. Ellis's opportunities for acquiring trustworthy knowledge on all that concerned Madagascar rendered him a reliable witness, he should much like to know from him the length and the breadth of Mahomedan influence, literary or religious, upon the island, and to receive some information in regard to the books said to be written in the Malagasy language and Arabic alphabet, and described in a paper in the French ‘Journal Asiatique.’

Mr. J. KESSLER said that from observations which were made at Antanarivo last year, it was ascertained that the city was placed by far too much west on the map, and that the river Ikopa, which came within three days' distance from the capital, and which was navigable for Arab vessels, had also been misplaced, and it is now settled that it empties itself into Bombatoko Bay on the west coast. With regard to the question as to the Arabic manuscripts or writings in Madagascar, the only authority we had was Flacourt, who was not altogether to be depended on. He mentioned twenty-eight books, partly astronomical, partly medical; but none of these could be found. He (Mr. Kessler) believed they were purely Arabic, and had nothing to do with Madagascar,—at least, not with the Malagasy language, except an Arabic and Malagasy dictionary. There were several Arabic words contained in the language, but, comparatively speaking, they were few. He believed the names of the days of the week were Arabic, and two names of the months. There were several Sanskrit words contained in Malagasy which had either been

handed down direct or through the Malays or some other tribe. There were some Hebrew words, many French, but few English. It would have been interesting to trace how the Hovas, who were the conquering race, and in numbers the most insignificant, reached Madagascar, and one way of arriving at a certain conclusion was by tracing the language. He had occupied his mind a good deal whilst at Madagascar, and had collected much evidence as to the ancient proverbs and laws of the country. He believed that by tracing the purely native language they would be able to arrive at a conclusion as to the manner in which the Malays (for they could not be anything else) had reached the capital or had come to Madagascar. There was no question at all that the Arabs had for a long time been settled on the west coast.

Mr. ELLIS, in reply, said he was grateful for the notice which had been taken of his paper. In regard to the origin of the people, he thought that three races had been ascribed to form the present inhabitants, or that they had been derived from three different sources: one, the opposite coast of Africa, the second the Malayan archipelago, from some family or portion of the large Malayo-Polynesian race, and the third unknown. It was too wide a question, however, to be gone into now. Mahomedan influence might have operated to some extent in former times, for the country was visited by Mahomedans before it was known to Europeans, and some few of the customs of the people may have a Mahomedan origin. There are also a number of Mahomedan tombs at Morondro and some other places on the west coast, but for more than a century Mahomedan influence has been but slightly if at all felt. He had referred to the Arabic, he had made many inquiries of the natives of the country where Arabs had been most numerous, and of the south-east coast which were said to have been inhabited by a larger portion of Arabs than any other. They had come there for the purpose of trade and manufacture, and employed the natives in carrying on the affairs of the depôts of trade, teaching the natives numerals, or so much only of their language as was necessary for keeping accounts and transacting business, but not writing any books. He (Mr. Ellis) had not been able to learn anything further with respect to the use of the Arabic language; certainly, it never was written or understood by any of the natives that he had been acquainted with. He had inquired of the natives in the country the traditions preserved among them respecting the Arabs, and whether they did teach their language to any of the Malagasy; but they all answered "No;" and that it was used for their own purposes of trade.

ADDITIONAL NOTICES.

(Printed by order of Council.)

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1. *Leichhardt Search Expedition.* Extracts from Documents transmitted to the Society by the Secretary of State for the Colonies.

IN vol. ix. of the 'Proceedings,' page 300, an account was given of the recent discovery of traces of the lost traveller Leichhardt, and of the movement which was, in consequence, set on foot in Melbourne by Dr. Mueller for an expedition in search of further remains of his party. The following communication has since been received on this subject from Sir George Bowen, Governor of Queensland:—

"Government House, Brisbane, Queensland,

8th August, 1865.

"Sir,

"I have the honour to report that the Queensland Parliament has voted 1000*l*. in aid of an expedition in search of the long-lost German explorer Dr. Leichhardt; that the Parliaments of Victoria and South Australia, following the example of Queensland, have voted each 500*l*. for the same object; that private contributions to the amount of about 1500*l*. have also been collected in Australia (chiefly in Victoria and Queensland), and that the sums realised from these various sources being sufficient to maintain the proposed expedition during two years, it has started on its journey.

"I may probably be expected to recapitulate briefly the salient points of this case. Dr. Ludwig Leichhardt, a native of Prussia, studied medicine and natural science at the University of Berlin. He emigrated to Australia in 1842, while still a very young man, and soon distinguished himself by his valuable botanical and mineralogical researches and collections in various parts of the interior, and especially in the districts now forming the colony of Queensland. In 1844 he undertook the leadership of an expedition which was equipped for the purpose of discovering an overland route between Moreton Bay on the eastern and Port Essington on the northern coasts. The Imperial Government at that period maintained a post (since abandoned) at Port Essington; and Leichhardt reached it after a journey of fifteen months, during which his party traversed upwards of 3000 miles of country, which, for the most part, had been previously unexplored. They returned to Sydney by sea, and were received with public manifestations of joy, as it had been supposed that they had all perished. Rewards were voted to Leichhardt and his comrades by the Colonial Legislature; and, after some delay and one unsuccessful start, another expedition was equipped, with which he determined to attempt to cross the Australian Continent from east to west—from Brisbane to Perth. Leichhardt started on his final expedition from Moreton Bay at the beginning of 1848, and the last account received from him was contained in a letter which he wrote in April of that year from the banks of the River Cogoon, in what is now the Maranoa district of Queensland. The mystery connected with his fate still remains to be cleared up after a lapse of 17 years. As it was understood that his journey would occupy at least two years, no special anxiety began to be felt for his safety until towards the close of 1851, when the Government of New South Wales sent out a party in search of him under the command of Mr. Hovenden Hely. Starting from Brisbane this party proceeded to the Maranoa district, whence Leichhardt's last letter had been despatched. Mr. Hely was there informed by some natives that the white men, with their horses and cattle, had been all killed by the blacks at a point about 200 miles to the west of Mount Abundance.

"Mr. Hely's discouraging report received general credence for some time; but of late years discoveries have been made which tend to invalidate it. Mr. Augustus Gregory, in his expedition of 1858, found what are believed by many persons to be traces of Leichhardt's encampments on the river Barcoo, far to the north-west of the spot where he was said to have been massacred by the aborigines. Again, Mr. Frederick Walker, when searching in 1861 for Messrs. Burke and Wills, found traces still further to the north, near the junction of the rivers Alice and Barcoo. Lastly, a few months ago, Mr. Duncan McIntyre, a pioneer squatter of Queensland, came upon trees marked with the initials "F. W. Walker" on the banks of the River Flinders, which flows into the Gulf of Carpentaria. Mr. McIntyre also found two aged horses in the same locality; and their discovery in close proximity to the marked trees is thought to render it probable that they belonged to Leichhardt's expedition. Here there were traces of the lost explorer more than

300 miles beyond the spot where he was reported to have fallen a victim to the hostility of the aborigines.

"Dr. Mueller, the Director of the Botanical Gardens at Melbourne, a friend and countryman of Dr. Leichhardt, has never ceased to urge the probability that the gallant leader, or some of his little band of explorers, may still be alive in some remote wilderness; and that a well-organised expedition might be the means of rescuing them from a long and dreadful exile among the savages of the interior. It will be recollected that in 1835, an Englishman, named Buckley, was restored to liberty and civilisation after a captivity of above 30 years among the native tribes which then roamed over the site of what is now the great city of Melbourne. Among several similar examples we may also mention the case of the shipwrecked sailor James Marrill, who, in 1863, was rescued by our frontier settlers after a captivity of 17 years among the blacks of Northern Queensland. Moreover, the question of a renewed search for the missing expedition was warmly taken up by Mr. Landborough and by other distinguished Australian explorers, and by several leading members of the medical profession (to which Dr. Leichhardt had belonged), who lately published an earnest appeal in his behalf.

"Dr. Mueller further conceived the idea of enlisting in this cause the sympathies, more especially, of the ladies of Australia. He succeeded in forming at Melbourne a committee of ladies, who undertook to collect subscriptions, and to press the question on the favourable consideration of the Governments and Parliaments of the several colonies. They addressed an earnest appeal to Lady Bowen to procure the aid of the ladies of Queensland, on the ground that this colony owes most to Dr. Leichhardt, having been to a large extent explored by him. In compliance with this appeal, Lady Bowen convened at Brisbane a public meeting of the ladies of Queensland, and the leading gentlemen of all parties attended. The President of the Legislative Council (Colonel O'Connell) occupied the chair, and made an eloquent and interesting speech, which will well repay perusal. I transmit a copy of the address as reported in the local journals, and also of the letter of the Victorian Ladies' Committee, tendering their services for Lady Bowen's assistance. Her social influence and that of the principal ladies of Queensland has since been exercised so successfully that the Colonial Parliament (as I have already said) has voted a liberal grant in aid.

"It need scarcely be added, however, without detracting from the merits of these ladies, that the shrewd, practical men who form the Government and Parliament of Queensland would not have sanctioned any expenditure of public money in a fit of enthusiasm, or without the certainty of tangible results. As the scene of the operations of the new "Leichhardt Search Expedition" will be principally within the bounds of this colony, it is felt that, whatever may be the success of the expedition in other respects, it cannot fail to add largely to our knowledge of the remoter portions of our territory, and so to assist materially in the development of our resources in various ways, and to an extent which will be cheaply purchased by a contribution of 1000*l.* from the public funds.

"Mr. Duncan McIntyre has himself undertaken the leadership of the expedition, which set out from Victoria a few weeks ago, and is to be finally organised in Queensland during the present month. It will consist of from 8 to 12 carefully-selected "bushmen," with 14 camels, and about 40 horses. Supplies of all kinds will be provided for a consumption of two years. The expedition will proceed in the first instance to the spot on the banks of the Flinders, where the last traces of Leichhardt were observed by Mr. McIntyre. Thence it will continue the search towards the interior of the Australian Continent in whatever direction the discovery of further traces, or information derived from the aborigines, may seem to render most advisable.

"Now that this enterprise has been actually started, no effort will be wanting on my part, or that of the Government, to afford it assistance. The explorers will be able to procure from time to time fresh supplies at Burketown, the new settlement recently established on my recommendation at the head of the Gulf of Carpentaria.

"G. F. BOWEN."

It may be seen by passages in the above communication, that the promoters of the Search Expedition believe other results will flow from the exploration, even should it fail in recovering any surviving member, or obtaining further traces of Leichhardt's party. Our geographical knowledge of the interior of the continent cannot fail to be greatly increased by the expedition so well-equipped, and commanded by so able a man as Mr. Allan McIntyre. On this aspect of the question Dr. Mueller thus writes, in a letter dated July 21, 1865, to Sir Charles Darling, Governor of Victoria:—

"Independently of our fulfilling the dictates of gratitude and humanity, incalculable advantages for colonization, industry, and commerce would accrue from a further exploration of this great and solely British continent, over which, unhindered by the native population, the stream of settlement may spread. I see that the thousand victims of cold and famine in overpopulated spots of the mother country, might find a new home in the unoccupied and everywhere salubrious Australian territory of the British Crown, might live in health and prosperity. I maintain that it has become a point of honour to the million and a half of civilised inhabitants, occupying as yet but little beyond the coast tracts of Australia, to throw open by exploration and by scientific research, for occupation, for industry, and for settled homes, the whole interior of this continent. I perceive that we cannot fix even the lines of the telegraph, which most advantageously are to unite us with the northern hemisphere, and indeed with the world, until we have withdrawn, as Leichhardt intended to have done, the veil from the still so extensively unknown interior. I cannot but contemplate, that of the real wealth of Australia in treasures of copper and gold we cannot form even an approximate estimate, until in many paths the space from coast to coast shall have been traversed."

2. *Foundation of Burketown, on the shores of the Gulf of Carpentaria, and extension of the Electric Telegraph in Queensland.*

SIR GEORGE BOWEN, the active and enlightened Governor of Queensland, has transmitted to us, through the Colonial Office, an account of the establishment of a township near the shores of the Gulf of Carpentaria, being the first settlement made in this fertile and promising region. It is situated at the head of the navigation of the Albert River, and has been named Burketown, in honour of the gallant but unfortunate explorer who lost his life in recrossing the continent of Australia in 1861. The district of Burke is being rapidly occupied by pastoral settlers, who drive their stock overland from the older districts of this colony, but who will receive their supplies chiefly by ships sent round Cape York to the new port of Burketown.

With regard to the extension of the electric telegraph in Australia, Sir George Bowen announces that the Legislature of Queensland will be ready to carry the electric wire at its own cost to Burketown, if that point be chosen as the connecting-link of the Australian wires with the submarine line to Asia and Europe, or to meet, at any point that may be arranged, a line coming from the new settlement in Adain Bay, if the latter terminus be preferred. The

telegraphic system of Southern Queensland was already being extended to Port Denison (20° s. lat.), and Mr. Cracknell, the superintendent, saw no difficulty in carrying it thence to the mouth of the Albert River, in the Gulf of Carpentaria, as sufficient suitable timber is at hand throughout the whole route.

3.—*Overland Journey from Rockhampton to Port Denison, viâ Bowen Downs and the Salt Lake.* By W. LANDSBOROUGH, Esq.

(Communicated by the GOVERNOR of QUEENSLAND.)

IN the end of last year and beginning of this year (1865) I made an excursion, 900 miles in extent, from Rockhampton to Port Denison, *viâ* the Mitchell District. My route lay chiefly over a tract of country which but a few years ago—that is, at the period of the Separation of Queensland from New South Wales—was an uninhabited waste. With the view of furnishing a sample of colonial progress, I purpose noting down a few particulars of my journey.

Rockhampton, my point of departure, has risen in eight years to the position of a thriving town of five or six thousand inhabitants. It is situated on the Fitzroy River, which is formed by a junction of the Dawson and Mackenzie. This town is the outlet for the wool produce of the Comet, Peak Downs, and Barcoo. Fortunate in having the companionship of a few friends, I was doubly so in having secured the services of a black boy, who proved very useful in mustering the horses every morning, saddling and packing them, fetching water, lighting fires, and washing our clothes. For 80 miles to the westward of Rockhampton, the road was thronged with travellers and drays; the townward ones being laden with wool, the return ones with station supplies. I observed that horse teams were becoming more common, probably on account of the prevalence of rinderpest, which has lately proved so fatal to cattle. Along this route, as far as the Dawson, every facility in the shape of hotels and good roads is presented to the traveller. The Dawson is easily fordable except during floods, when there is the convenience of a punt. On the further bank, the road branches off into two, *viz.*, the Peak Downs and the Barcoo roads. Following the latter, I met with no hotel for a distance of 188 miles, but there is the usual resource of sheep stations within easy riding distance of each other.

The line now crossed is the watershed of the Comet and the Nogoa Rivers of the Leichhardt District,—perhaps the finest grazing country of North Queensland. At Mantuan Downs, about 325 miles from Rockhampton, I diverged to the right from the Barcoo road, following a by-path called Hodson's Track, which leads to Arramac Creek, a feeder of the Thomson. The more common route, by the Barcoo, is 100 miles longer, but possesses the advantage of avoiding an extensive tract of poor country stretching northwards. This is variously styled the "triodia," the "poison" country and the "Desert." The poison plant (*Gastrolobium grandiflorum*) abounds on its sandstone ranges, and Mr. Hodson, who first took sheep over it, lost nearly a thousand at one place. A ride of 16 miles brought us to Fairview Station, on Balmy Downs—one of the best sheep-walks of the Leichhardt District, which comprises the watershed of the Comet, Nogoa, and Isaac Rivers; and next day's ride of 35 miles lay over the Belyando watershed of the Kennedy District.

Having enjoyed the hospitalities of the proprietors of Alpha Station, we prepared to cross the Desert alluded to. The country being uninhabited except by wild blacks, for a distance of 165 miles, we bought provisions, and put our firearms, for the first time, in order. A ride of 10 miles took us over the Belyando Range into the Mitchell District, and we continued our journey 20 miles further before encamping. Our second day's journey was

protracted to an undesirable length, from our omitting to encamp at Birkhead Creek, where, being only a 20-mile stage, and not knowing what was before us, we encamped just long enough for dinner. Subsequently the darkness prevented our detecting other water-holes, until we had accomplished an additional ride of 32 miles—the entire journey having kept us thirteen hours in the saddle.* At first we were finding that the water was salt; but a minute search resulted in the discovery of a fresh-water hole, singularly enough in the midst of the others.† The general character of the country, as far as Birkhead Creek, was sandy and rather level; yet that country, so good, was proved by Mr. Hodson's sheep having for a thriven well upon it. Thenceforward, for about 15 miles, the land was very much infested with *triodia*—a bad thing for sheep, and with occasionally high barren ridges with the poison *N. n. n.* The country on the whole was fair to the eye; but we were ever deceived by its treacherous appearance, for this was the scene of Hodson's disaster above alluded to, and the bleached bones of the sheep scattered over the surface told the luckless tale. The latter part of the way comprised rich plains, abounding with those infallible indications of excellent pasturage, the tall cabbage saltbush. The only blacks we saw since leaving the Dawson we met with here; and these were represented by a few black gins, one of whom held a fat child in her arms. "Piccaninny"—originally, I imagine, a *negro* word—was the beginning and ending of our intelligent conversation.

At a distance of 18 miles, we reached the junction of a creek with the Alice River. The latter had all the characteristics of a fine river when flooded, but it was then represented by a wide sandy bed and water-holes, containing sometimes fresh, sometimes salt water. The adjoining country is poor, and infested with *triodia*; but the rearward country consisted of remarkably rich plains. The *triodia* ridges on the banks of the river, however, will doubtless prove serviceable for sheep in wet weather; while the *gidya* scrub—which I also observed on the rich land adjoining—will shelter them from the summer heats.

Next morning, the track brought us, from time to time, during a ride of 9 miles, in sight of the river; but we soon left it, and four miles further on encamped for dinner, on a low flat, subject during floods to inundation. Here we met with a traveller who had been deserted by a timid friend, and our acquaintance, being entirely unprovided with firearms, may be fairly considered as rash as his companion was timid. We were stupidly enough tempted by him to camp here for the night. We were now fairly on excellent pastoral country, and within a half day's journey of the stocked country of Arramac Creek,‡ which consists of fine tracts of grassy downs, belted with *gidya*, though wooded with another kind of acacia, called *myall*. Superior for fattening purposes to even the regions of the Comet and Nogon, this district has the disadvantage of being farther from a sea-port, and more liable to drought.

A long ride brought us, by way of Messrs. Rule and Lacy's station to my destination, Wilby, on Arramac Creek, thirty miles above the point crossed by me in 1861, in the expedition in search of Burke and Wills. After our ride of 550 miles, we were not sorry to recruit ourselves and our horses.

* The pace was usually four miles an hour; and this is practically found as much as grass-fed horses, with a long journey before them, can easily manage.

† This is a common characteristic of Australian water-courses.

‡ On Stanford's Library Map of Australia, Arramac Creek is laid down with a south-west course; but in Owen's (a more recent map) the course, as shown by it, is nearly west for upwards of sixty miles. On this subject I cannot give a decided opinion, as I cannot lay my hands on the rough chart of Arramac Creek when I first discovered it.

In a fortnight we were again in the saddle, and our course now lay 40 miles due north to Bowen Downs Station, on Cornish Creek. During this entire journey we found no water. Nevertheless, the country was of a first-class description, and so free from trees that the wool-shed was visible at a distance of eight miles. Notwithstanding the absence of rain for eight months (except at the heads of the creeks) the stock of every kind—even on dry parts—was in a thriving condition. The only bush news we heard was that a herd of cattle had been safely taken hence to the Plains of Promise, near the Gulf of Carpentaria; and that in the same latitude, but some forty miles westward of my overland track, a fine river, flowing through excellent country, had lately been discovered. It was named the Darr, and may ultimately prove to be the main head of the Thomson.

After a sojourn of a week at Bowen Downs, we had the good fortune to meet with a traveller who was acquainted with the route to Port Denison. His intention was to meet a flock of sheep on the further side of the poison country, and to pave the way for them by cutting down the noxious plant. Our route lay north-east, in the direction of Sutor Creek, or (when the combined streams are spoken of) more properly, the Belyando.* There is abundance of water for 58 miles, as far as the Fisheries, on Cornish Creek. This point was so named as being a fishing-ground for the blacks, and their peculiar process of catching was to construct a hedge across the Creek. This is a dangerous locality, if one may judge from the mysterious disappearance, a few weeks previous, of my friend Mr. Meredith and an overseer. Their encampment had been since identified, and some of their property had been found in possession of the blacks. Altogether, they were both such good bushmen that there is no likelihood of their having been lost while searching for their horses in the morning; although they may have met their fate while so engaged. While in this region we kept a night-watch, somewhat to the surprise of our travelling companions, to whom the proceeding was entirely new. In fact, I have never known any travellers did not carry even firearms in this district, noted as it had become for the unexpected attacks of the blacks. We rode 13 miles further—as far as the Duck Ponds—without finding a trace of the poison plant, and here we found patches of excellent grass, amply sufficient for travelling stock. But we were long found the plant alluded to, within eight miles of the “Public-house† Water-holes,” and subsequently in abundance on the ranges leading to the Salt Lake, whither the creek just mentioned flows. It naturally requires great expertness and caution on the part of the shepherd to keep his sheep from tasting the deadly plant, and it is now becoming the custom to send men ahead for the purpose of cutting it down. Still I think the evil may be obviated by a new track, provided the ranges on which the plant flourishes can be avoided, which is extremely probable.

With regard to the above-mentioned salt lake, I may mention that it was discovered by Mr. Buchanan from a tree which he had ascended for the purpose of viewing the country. It is several miles broad and 20 miles long; it is surrounded by wooded hills, and has no outlet. To the taste the water is more salt than that of the sea, and where evaporated on the margin the salt can be easily collected, and it has been proved to be so far fit for common use that it has been used by the settlers.

We had a fine view of this singular phenomenon from the Sandstone Cliffs near our encampment, and we bathed in a pool occasionally covered by the lake. The pungency of the water made our skins smart. This site being at the south end of the lake, and forming the unavoidable passage for drays, is

* The Sutor and the Belyando form the “Belyando”—not the “Sutor,” according to the maps.

† Doubtless so called for Paddy’s reason—that there is no public house there.

well adapted for a township. (The lake is named Buchanan Lake, from its first discoverer.) In that contingency, fresh water will doubtless be procured by sinking wells, or from M'Glashan's water-holes, in the neighbourhood. These will hold water during a six months' drought. I should mention that the shores of the lake are covered with salsolaceous herbs.

Passing the Whistling Duck Holes, we arrive at what is ludicrously named the Jumb—a sandstone dyke, rising several feet, and situated on the north-eastern range of the Salt Lake. This is, of course, a most difficult ascent for a team, and none but a remarkably strong dray could ascend it with impunity. But the teamsters on that route are not to be daunted by a mole-hill. We here had a farewell view of Buchanan Lake, and a ride of 4 miles brought us to deep sandstone water-holes called the Tanks, situated on the north-eastern side of the Belyando Range. The bleached bones of many sheep again proclaimed the proximity of the poison plant. Three thousand were lately lost on this track, but I have not heard of either horses or bullocks (except a few hungry ones that were turned out to feed near the Tank, where there is no grass) being poisoned.

Eight miles further on we left the poison country behind, and encamped at the Pigeon Water-holes, in the valley of the Belyando, and next day we successively passed Tomahawk Creek (6 miles), Rocky Creek (12 miles), Sandy Creek (21 miles), putting up at Bully Creek (33 miles). Here we gladly accepted the hospitality of that station and rested two days, the horses having travelled 163 miles.

The great valley of the Belyando, being profusely wooded with brigalow and gidya scrubs, has hitherto been little occupied; but as the sheep thrive well even in the thickets alluded to, I have no doubt this district will, when the blacks can be trusted, be in demand.

The last 100 miles of our journey lay through what is called by squatters "coast country," not generally the most favourable for sheep. Although the grass was more rank than hitherto, the country was picturesque, consisting of mountain and vale, while the margins of the watercourses were clothed with palms and other trees of luxuriant foliage, gracefully festooned with creeping plants.

Bowen, the town at Port Denison, has been known only since April, 1861, and already (1865) numbers above 1000 souls. It is picturesquely situated on Port Denison, within Edgecombe Bay, which are separated from each other by Stone Island, to which Gloucester Island, which shelters the outer bay from the ocean, is parallel. This latter island rises from the bosom of the deep much in the manner of the Scotch Isle of Arran, to which it in many other respects bears a close resemblance. The entire scene justifies the apparently boastful comparison of its inhabitants with the Bay of Naples; the distant island hills wear a lovely aspect, and the coast line of the mainland is in keeping with their bold grandeur. The high mountains on the coast are all the more beautiful from rising abruptly from the plains. For a tropical country the climate is pronounced excellent: severe frost in winter is sometimes felt within a few miles of the coast, while the summer heats are tempered with sea breezes.

Having had no intention of writing this paper at the time of my journey, I have had to trust principally to memory; and, therefore, could not fail to omit a variety of particulars of interest and future importance.

TABLE OF DISTANCES.

I. ROCKHAMPTON TO BOWEN DOWNS.

	Miles.
Rockhampton to Westwood Hotel	32
Thence to Rio	36
Knebworth Hotel	5
Roxburgh	6
Nulalbin	28
Barangal	20
Bauhinia Downs	12
Planet Downs	40
Sheridan's	12
Albinia Downs	22
Orion Downs	25
Rainsworth	18
Springsure	5
Mantuan Downs	60
Fairview	16
Alpha	35
Belyando Range	10
Hodson's Old Yards	28
Birkhead Creek	12
Chain of salt and fresh water-holes	32
Alice River Crossing-place	16
Gidya Scrub water-holes	15
Springs	23
Rule and Lacy's	29
Wilby	16
Bowen Downs	40
	<hr/> 593 <hr/>

II. FROM BOWEN DOWNS TO PORT DENISON.

	Miles.
Thence to of Cornish Creek	50
Thence to	8
Duck Ponds	13
Place called Public-house Water-holes	25
Water-holes, a mile to the right of the road	10
South end of Lake Buchanan, or Salt Lake	1
Whistling Duck Water-holes	6
Jump on the range	4
Natural Sandstone Tank	4
Pigeon Water-holes	8
Tomahawk Creek	6
Rocky Creek	6
Sandy Creek	9
Douthy's Camp	8
Bully Creek	5
Vine Creek Station, near Belyando River	20
Cattle Station on Belyando River	31
St. Ann's on Belyando River	16
Mount Wyatt	18
Hidden Vale	12
Strathmore	25
Bogie Public-house	25
Bowen (Port Denison)	40
	<hr/> 350 <hr/>

4. *Extracts from Commander W. F. Ruxton's Report on various Rivers on the West Coast of Africa.*

(Communicated by the FOREIGN OFFICE.)

THE following items of information, chiefly Geographical, are contained in the despatches of Commander Ruxton to his commanding officer, Commodore A. P. Eardley Wilmot:—

Mallacorree River.—The slaves in this country, who are very seldom sold to foreigners, are carried partly by canoes and partly by land round at the back of Sierra Leone, from the Sherboro, through and from Quia, across to Sierra Leone River, and are sold among the Zeezoos, and in the Barrizee country. The lawful trade of the district is very considerable, and no slave-ships have been in the river for many years. Horses, cattle, and sheep are in great plenty. Morricannah and Mallacreeh are both large towns, stockaded, with a population principally Mussulman. There is a Marabout priest, a Fellatah, I think, at the former place, who exercises some control; but the chief is Yemba Lamina. The headmen of houses or elders have, however, the real power.

Dobreeka River.—Vessels of 10 feet draught can go up this river a long way—40 or 50 miles. It runs from the eastward, making a bend round the Peak of Kakulimah, and finds its way into the sea opposite the Isles de

Los. The country is volcanic. Masses of tufa show here and there. If the Mountain of Kakulimah is not active at present, it has been so within a very recent period, and smoke is said to be seen on its summit during the excessively clear periods which follow the tornadoes during the commencement and break of the rainy season. The natives say it burns; but the name Kakulimah implies "it is steep, impossible of ascent." I am strongly of opinion that the Isles de Los and the neighbourhood was the turning point of the voyage of Hanno, the Carthaginian. It seems to agree better than the other numerous places mentioned as the turning point of that famous expedition. The description given to me of the country from Jeba to the Mellacorree, as it was thirty years ago, seemed to agree in a wonderful manner with Hanno's account; almost the same words were used by my informant, and he described the great herds of large baboons in the country. Both the population and the cultivation appear to have decreased, during the last half-century, in all this country. On one occasion we crossed by crocks from the Dobreeka into the Bremiah River, and pulled up the latter till we came to the rapids, above which the tide does not flow. For the last 18 miles we had the hills of Loomba on our right, distant not more than 5 miles, and running parallel with the stream, which ran to the north-east. They were covered with bright green grass, and large open spaces clear of trees, and were from 1800 to 2000 feet in height. Two distant terraces, like the parallel roads of Glen Roy, ran along the south-west side; indeed, my attention was called to them by the men pointing them out as "a real road." They were probably ancient beaches, and were some 800 feet above the sea-level. We landed about half a mile below the falls, and set out to walk to the town, not far distant. We ascended over limestone-rock all the way to the stockade, about three-quarters of a mile, and about 300 feet above the river on a sort of plateau. The sun was just rising, large and red, as I looked round and down the path we had come up. To the southward the lofty peak of Kakulimah, with its conical crater plainly visible, stood out in the solid darkness, casting its dark shadow over the plain. On its left, with the light just glinting their green sides, stood the Paps of Loomba, while hill and forest, stretching away, brought the eye round to the river, clear and bright, and dashing along through rocks and foliage till it was lost among the huge overhanging trees. The morning air was fresh and clear; far away towards the sea, the mist rose heavy and clammy from the sodden mangrove swamp, but where we stood it was bright and invigorating. Soon after 8 A.M. we began to retrace our steps, with oars again, and, except for one short hour, the boats' crews pulled on till 6 P.M. There is a creek running to the northward on the right bank of the river, and about 4 miles from its mouth, called the Cabaleer Creek.

Rio Pongas.—This river, well known in the annals of the slave-trade, has the character of an estuary, with one large river and many small streams running into it. It has four mouths—viz., one to the south, the Cantiloon Bar, not passable, except for large launches in fine season; Sand Bar, 16 feet water at high-water spring-tides; the Mud Bar, about the same water, but safer, for the bottom is mud and the rollers less heavy, but it takes a sailing-vessel four or five days to get round from it into the main river; the most northerly is the Taponea Bar, about 6 feet water, and a heavy surf. There are creeks running in all directions, in which it would be easy to hide a vessel. I pulled up the river for many miles, expecting it to get more narrow, when suddenly I found myself under a range of hills; in front and at their base lay what appeared to be a ruined town, but was in reality pillars and rocks of basaltic formation, worn by weather or by water in former ages into curious contortions, one appearing like a village church. Many small streams formed a sort of basin with numerous islands. On our left was the stockaded town of Lana; in front, the town of Bangalong, formerly a large and influential place, having

a large trade with the interior; and on our right, in an admirably selected situation, rose the Fort of Farinhia, still well-kept and strong. The country is clear and open, plenty of cattle, and milk in abundance. The trade is entirely in the hands of the French.

Rio Nunez.—Though on a larger scale, this river is an estuary, like the Pongas. Large vessels can go up 30 or 40 miles with the greatest ease. There is plenty of water over the bar, an admirable spot on Sand Island to beach a vessel, 13 feet rise and fall, and a hard sand-beach to lie on. There are no inhabitants, and a vessel drawing 3 feet of water can go up to Debucko, where the French have a concession of land. The legitimate trade of the district is very large and almost entirely in French hands. The people of the upper part of the river belong to the Naloo tribe. Near the sea live a part of the Bagas. The chief, Yarraha, is a Mahometan. The river is a very fine one, and Debucko is the place where the great paths from the Foulah country first strike the salt water. All the trade, even that going down to Sierra Leone, passes a very few miles from this place.

Componee River.—A large river, with a shallow bar and strong stream. Little or nothing is known of it; even at Sierra Leone the name is scarcely known. The natives are said to be treacherous and warlike; but I had one or more boats in it and off it for two months, and found them harmless and quiet. They are Naloos. About 7 miles up, on the southernmost bank, there is a large creek running to the Nunez, which it enters above Victoria.

Carsinee River.—A large river or inlet, with a depth of from 8 to 10 fathoms. It lies nearly due north of the island of Alcatras, and there are two small islands off its mouth: one has fresh water on it, and is not marked on any chart, nor is any of the country in the neighbourhood surveyed. I was told that elephants were still to be seen morning and evening in herds. My informant stated that it was a separate river and did not communicate with the Rio Grande.

Slave Trade.—It has been a generally received idea that the slave traffic from the North coast between Sierra Leone and Gambia was nearly extinct. It appears to me, however, that it is like all other trades, if there is a demand there will be a supply, and if the people in Cuba want slaves they get them. If they are not in want of them, then, and then only, the trade ceases. There are rivers, creeks, towns, provisions, water, and slaves, in places where no British man-of-war has ever been, and of which there is no record and no surveys whatever. A large trade in large ships is carried on over what is marked in our latest charts as unknown. Treaties are made with, and subsidies paid to, people actively engaged in the slave trade. The people will sell anybody. Yurrah, head chief of the Nunez, told me that if he wanted money he would sell his brother. The very people who have been dragged from the hold of the Spanish slave-ship by British seamen, fed and nurtured by the British Government, and even now in drink and immorality drag along their vicious lives under the protection of the British flag, are the foremost in the race to enslave their hapless countrymen. In Sierra Leone the plans hatched in Cuba bring forth their evil brood. The mail steamer in comfort brings the gentleman slave-dealer: he generally carries with him a considerable amount in doubloons and dollars, with a good bill or two on a certain London house; rarely he makes use of agents, but generally proceeds himself to the rivers in a large native canoe; he then enters into agreements with the native chiefs, first giving them a large "dash," or present of money and goods, and then the stipulated sum of 35 to 45 dollars for each slave. From time to time the number of men-of-war on this station, with the character of their captains, their probable time of being at sea or at Sierra Leone, with their respective orders, are, strange as it may seem, communicated to him. On a certain day a message reaches him, sent in some inconceivable way, only to be guessed at by those

who know with what wonderful rapidity intelligence travels among the natives; not till then does the trader repair to his rendezvous. In a day or two a fast boat, with the captain or supercargo of the slaves meets him: all is arranged—time, places of call, the number to be shipped, and so forth—and the captain returns to his vessel that has been securely moored in a hidden mangrove creek, in some place not marked on any chart. On the appointed day every precaution is taken to see that the coast is clear. The schooner hauls out with the aid of canoes, and she starts for her destination. Sometimes there is an alarm, then she is again hid; but if not, she lays off the appointed bay or river, and the collected negroes are shipped at once in boats, canoes; cutters, and sometimes even in boats of merchant ships, and with the morning land-breeze she soon leaves the coast behind. Formerly slaves ran direct for the river they were going to ship in; now they wait in one river and ship anywhere, the slaves being collected and sent down to them. The gentleman slave-dealer sees the white sails slipping below the distant horizon, gets into his boat and returns to Sierra Leone, starts for Teneriffe by the English mail-steamer, and brags on the way that "he does more to civilise Africa than all the wealth of Britain." The misery and sickness amongst the crews of slavers makes it wonderful to me how they manage to get men to man them.

There is evidently a movement going on, tending to break up the slavery system as carried on among the natives themselves. This is totally unconnected in any way with either our colonies or our missionaries, nor is it to be attributed to any British or foreign influence. There are two small districts, one inland at the back of the Baga country, near the head of the Dobrecka River, and another nearer the sea, about six hours' march from Canyap, on the south or left bank of the Nunez, where a number of runaway slaves hold out against their former masters. The last-mentioned place is called Cuba-ti-fing, a town founded 14 years ago by a body of slaves, said to have escaped from the Foulah country. It has greatly increased of late, and they are said to be able to bring 1000 fighting men into the field. The head man belongs to the Bambara country, and his name is Farer; it is curious that in speaking of him in English the natives never style him king, chief, or head man, but always governor. The town was attacked last year by the Foulahs, assisted by the Zozoo chiefs, but they were beaten off with great loss. My informants told me that the people of Cuba-ti-fing worked very hard, had plenty to eat, but great difficulty in obtaining arms and ammunition; that any runaway slaves were gladly received and had land given to them; but still it seemed to be admitted that some of the head men would buy slaves if they could. It was said they would not sell them, but I doubt that part of the story.

5.—*Letter from M. Gerhard Rohlfs.*

Since the last letter which we published from this intrepid traveller, he has undertaken another journey across the Sahara, starting from Tripoli. In his last journey he entered from Morocco, crossing the Atlas, and reaching the oases of Tuat and Tidikelt; returning by a north-east route to Ghadames and Tripoli. It appears now to be his intention to traverse the eastern side of the great desert, and endeavour to reach Waday, to recover, if possible, the papers of the unfortunate Vogel. In aid of this new expedition the Royal Geographical Society has granted M. Rohlfs 100*l*. A considerable sum has also been subscribed in Germany towards his expenses.

"SIR,

"Murzuk, 28th November, 1865.

"I have the honour to inform you of my arrival in Fesan, having reached here by way of Garia Ischergia, Bu Gila, Schati, and Sebha. Continually

tormented by the most frightful heat, we were 28 days on the road from Misda to Murzuk. The most interesting result of my journey, so far, is the measurement of the Djebel Shoda, south of Sokna, which stretches considerably towards the w., and attains its greatest altitude in about $14^{\circ} 20'$ E. of Greenwich, in Djebel Nabet es Djug. Although my aneroid stands 100 millimètres higher than those of other travellers (according to the reductions made on Petermann's maps), it yet showed the remarkable altitude, for the valley, of more than 1800 feet. Ascending one of the nearest hills, which is at least 650 feet lower than the Nabet es Djug, I found my barometer down to 680 millimètres, giving an absolute height of 2988 feet. The Nabet es Djug may therefore be a little higher than 3600 feet. I have secured several specimens of rocks. The mountain mass consists principally of coarse-grained sandstone, blackened on the surface. In this mountain range, broken by numerous narrow valleys, the Aggarha and Hottmann tribes pasture their herds, and a rich food for camels. In Murzuk I have found (thanks to the kindness of the Prussian Embassy at Constantinople) a good reception, and intend shortly to take my departure. What route I shall follow I cannot at present say, as I am yet in treaty with the persons who are to forward me. I think I shall be able to reach Wara, a frontier place of Waday, by way of Tibesti and Borgu, where I shall be well received, and hope to carry out my design of reaching the Sultan, and recovering the papers of Vogel and Beurmann, which are of so much scientific value.

"I shall inform the Royal Geographical Society of the route I eventually fix upon before I leave Murzuk.

"GÉRHARD ROHLFS."

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

[ISSUED MAY 5TH, 1866.]

SESSION 1866.

Fourth Meeting, Jan. 8th, 1866.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

ELECTIONS—*The Right Hon. the Earl of Arran; William Bevan, Esq.; Rev. J. Hunt Cooke; Dr. Lister, R.N.; Lieut. S. P. Oliver, R.A.; George Rehden, Esq.; Admiral Ramsay; William Gordon Wotton, Esq.*

ACCESSIONS TO THE LIBRARY.—‘*Polish Experiences during the Insurrections of 1863-4,*’ by W. H. Bullock, Esq. ‘*Journal of J. G. Macdonald, Esq., during an Expedition from Port Denison to the Gulf of Carpentaria and back.*’ Presented by the Authors. ‘*Castaway on the Auckland Islands,*’ by Capt. Thomas Musgrave, R.N. Presented by J. J. Shillinglaw, Esq. A book of Japanese Drawings. Presented by R. Carrington, Esq., F.R.G.S. ‘*Vancouver Island and British Columbia,*’ by Matthew Macfie, Esq., F.R.G.S. Presented by the Author. Continuations of Journals, Periodicals, &c.

ACCESSIONS TO MAP-ROOM.—Map of Virginia, showing the military positions during the late war, by C. Sholl, Esq. Six Atlases, presented by Miss Swinburne, viz.:—1. West India Islands belonging to Spain; 2. Orkney and Lewis Islands; 3. West India Pilot, by Jefferys, 2 vols.; 4. Atlas Maritimo de España; 5. The Atlantic Neptune, by J. Des Barres, Esq.; 6. Le Neptune Oriental (French). Ordnance Maps and Admiralty Charts up to date.

The paper of the evening was the following:—

1. *Second Journey into Equatorial Western Africa.* By M. P. B. Du CHAILLU.

My objects in going back to Africa were manifold. First, I wished to study still further the so-called primitive and unsophisti-

cated men of nature, in observing their habits, religion, mode of thinking, and language, as far as I could; and I hope I have been able to add something to our knowledge. I have written down many of their legends and fables. The long time I was obliged to remain in the Ashira country enabled me to acquire sufficiently the language of that tribe, and was of great use to me afterwards. I may say, that in their customs, superstitions, and legends, these people are all as I have represented them in my published work. In reading the books of Burton, Speke, and Grant, I find now and then words of Eastern Africa identical with those of the west, or nearly so. I have very little doubt that all along the equator, from east to west, these numerous tribes came from one parent stock; and I think it would prove very interesting to ascertain how the people have separated themselves into so many tribes, and what led to the splitting up of tribes into clans. I have not been able to obtain sufficient light on this subject to form a positive opinion.

A fact which greatly attracted my attention was the gradual decrease of the population both on the sea-shore and in the interior. My second journey among the inland tribes, where the white man and his fiery water have never reached, has proved to me that the cause of the gradual decrease of population in this part of Africa lies deeper than the influence of the white man. All travellers who go over the ground a second time say that the population is decreasing, although some attribute this to one cause and some to another.

Next to observing the customs of primitive races, I desired to plunge again into the great domain of Nature, and study the habits of the other living creatures which inhabit these vast forests; for wherever I have been the country, with very little exception, is a vast jungle, where man is but thinly scattered, and where no beast of burden can be found—man and woman being the only carriers.

I left London on the 5th of August, 1863, and reached the Fernand Vaz River on the 9th of October. I was received by the natives with great demonstrations of joy. Unfortunately on coming ashore the canoe which contained the greatest part of my scientific instruments, chronometer, &c., was capsized, and the loss was irreparable to me in that country. Happily by the end of the following August a new set reached me from England, and my greatest thanks are due to Sir Roderick Murchison and the Fellows of this Society for the great interest they took in having these instruments replaced, and also to Captain George, my old teacher, who superintended

their transmission. Permit me to state, that whilst I was detained for a space of ten months in waiting for these essentials, I was not idle. I employed my leisure time in collecting specimens of the fauna and flora of this productive part of the country, and remitted my collections to England, where, I am glad to say, they arrived safely, and have been in part deposited in the British Museum. I then commenced my journey into the interior. I will not detain you here with all the troubles which preceded my departure and attended the beginning of my journey. I shall proceed at once to state, that when I found myself at the head-waters of the Ovenga River, waiting, with my old friend the chief, Quengueza, for the Ashira porters which King Olenda was to send me, I had with me only ten men and boys. I could get no more. These men were to be my body-guard to the end of my journey. I had always grateful feelings towards them for the great confidence they placed in me. I felt safe with them, for they were people of my own tribe, the Commi, with whom I had long lived; and not a man, I believe, in that tribe would ever try to injure a hair of my head. I only wished that thirty instead of ten could have been induced to come with me, for if I had had a larger body-guard I should not have been driven back as I was. It was a great comfort to me to know that none of these men would be unfaithful to me. They trusted me, for they knew that I should never leave them in danger and sickness.

After a good deal of trouble, for the difficulties of transport in these regions are enormous, I reached the village of Olenda, in Ashira-land; situated 110 miles from the mouth of the Fernand Vaz, by the route I followed. Old Olenda received me with open arms, and said he loved me as he would a sweetheart; but I was obliged to say, when he became rather exacting in the way of presents, that I was afraid he loved my goods and not me. He wittily answered that he loved both.

From the country of the Ashira I passed through the territories of the Bakalai, Komba, and Avia tribes, on an excursion northwards to the Samba Nagoshi falls, which I had not succeeded in reaching on my former visit. The journey was full of hardships, but I succeeded. The distance was 50 miles N.E. by N. from Olenda. On the road I had a little adventure with gorillas. I had been wet the two preceding nights and days by continuous rains (for it rained 26 days during that month) and did not feel well—in fact, I was not strong enough to carry my revolver and gun. I was quietly going ahead of the party, when my attention was suddenly drawn to a crashing noise in the neighbouring trees. I thought it

was produced by a flock of monkeys. I advanced cautiously in order to see what they were doing, and, to my surprise, counted ten gorillas, who, as soon as they saw me, came down and made off for the dense forest. One old male alone remained, and came down half-way to look around and see what was the matter. He gave a terrific roar and looked at me. Happily, my men came up, and the monster made off for the bush. We must assume from this circumstance that the gorilla is, at least sometimes, gregarious—a feature of its habits which I denied in my former work. Whilst I am on this subject, I will take the opportunity to say that I am now convinced I was wrong in stating in my former travels that it was the chimpanzee and not the gorilla that the old Carthaginian navigator Hanno relates having captured alive, for during my late journey the negroes captured an adult female gorilla, and I had her in my possession several days. Full-grown animals may therefore have been captured, and the species is not uncommon near the sea-shore at one part of the coast. I have seen in this journey a large number of this wonderful beast, and have had four alive at different times. After these opportunities of further observation, I see nothing to retract in the account I have formerly given of the habits of the gorilla.

We reached the river Ovigui, and after a few hours' sail down the stream emerged into the great Rembo, which was much swollen. We saw nothing but deserted villages, which gave to the shores a look of monotony and sadness so common in Africa. Finally, we reached the village of Suba, of the Avia tribe, situated above the rapids and falls.

The falls and rapids are called together Samba Nagoshi. A legend runs that two spirits, male and female, dwell there, and cause the commotion in the waters to prevent people from descending and ascending the river. In the middle fall lives the spirit Foogamoo, who roars and impels the waters with tremendous force.

There are three falls. The first, called Nagoshi (after the female spirit), is nothing but a rapid, and the river there has two islands. I was quite disappointed, for I thought this was the main fall. But my guides then told me I must see the central fall, the Foogamoo, which was the great cataract, about 12 miles lower down. So after being delayed by two or three days of heavy rain, we started, and at the end of a long walk through the dense jungle we came before the great Foogamoo, the mighty spirit. The river here was about 150 yards wide, with an island in the midst, which breaks the fall into two, and consequently prevented me from seeing the other half. The fall on the side of the river where we stood was perhaps 70

yards wide. The other fall could not be more than 20 or 30 yards wide; but the greatest part of the stream falls on that side, and with tremendous force. The height of the fall was about 15 feet, and though grand, it was nothing in comparison with the mighty surge and foaming below the cataract, which rushed along, billow after billow, as far as the eye could reach.

On my return to Olenda from visiting the falls, I began to speak of going further into the interior, and said I should like to go through the Apingi country. But Olenda said I could not go through the Apingi country, because a few days after I left in my former journey my friend Remandji and his eldest son died, and that immediately the people had said I killed him in order to travel with his spirit. So I was obliged to abandon the Apingi route, and resolved to proceed through the Otanda country, a little to the south of Apingi.

Whilst we were making preparation for our journey, a fearful plague—the worst type of confluent small-pox—broke out, and the once beautiful and lovely Ashira country became a land of desolation and mourning. Nothing could be heard day and night but the wailing and moaning of the dying or mourners for the dead.

Finally, I prevailed on my good and noble Quengueza to go back to his country, although he did not depart until he had seen part of my luggage on the way, and made Olenda promise that he would send me with the remainder very soon. When I sent the first part of my luggage I called my men together, and said—"My children, I want you all to go with this luggage: I will follow with the remainder by-and-by. I am afraid that if you remain here you will get the plague also, and some of you may die. For myself, I am not afraid." They said nothing, went away, and in a few minutes came back, saying, "We cannot do what you told us, father; we cannot leave you in this land of sickness: who is going to care for you if we leave you? What would the white men, what would our own people, say? No; some of us must remain with you: if we are to get the plague we must get it, but we shall not leave you alone here among these savages, so name half of our number to remain with you." I cannot express with what feeling I heard them; they were so earnest. I took five and sent five, and so five went with the first half of the luggage to the Otanda country.

The plague afterwards increased in virulence. Olenda, my only friend, died, and many accused me of having caused his death by magical arts. My poor men became all ill. I stood alone, and wherever my eye rested, what a sight! living men looking like in-

animate carcases; others mad (for the disease brought insanity); maggots could be seen dropping from the bodies of many. What a heap of suffering humanity! It was not for a day, but for a whole month, that I had to endure the torment. You may conceive my wretchedness—indeed, I envied the poor and starving of our land; for although starving myself, I had a scene of horror around me from which they were exempt. In my forlorn state I felt that my reason would give way. But several of the sick men said, “Do not let your heart be troubled: you will go where you wish to go.”

Finally, our party having recovered, I succeeded in leaving the Ashira country for the country of Otanda. There I found my other men stricken with the plague, or small-pox, and the whole country, with the exception of the chief, unwilling to receive me, for, said they, wherever the white man goes, he brings death and kills the chief; witness Remandji and Olenda. As fate would have it, four days after my arrival Mayolo, the Otanda chief, became ill, and his life was in danger. Finally, he got better, and we then prepared for the continuance of our journey.

Mayolo was a good man, but very avaricious. I made the unpleasant discovery that he was practising one of the superstitious arts of the country upon me in order to open my heart towards him, that is, make me generous in giving him presents. This was the “alumbi,” and consists in administering to the guest operated upon doses of the powdered skull of a deceased ancestor, mixed with food cooked by the wife. My suspicions were aroused when I found the cooked meal sent to me with such great punctuality; but I had just obtained information of this strange custom, and refused to eat of the dish. The way the thing is prepared is this: when a chief dies his head is cut off and placed in the midst of a quantity of clay in a vessel. All the soft and liquid parts are absorbed, and the skull then preserved in the “alumbi” house; and when it is to be used the chief goes in and scrapes a quantity of powder off the bone. The saturated clay is also used for anointing the body as a charm.

Mayolo's village is situated E.S.E. of Olenda, the capital of Ashira-land, and is 40 miles distant from that town. After leaving it we travelled nearly due east and passed through the Apono country, meeting with many difficulties, owing to the fear of the inhabitants that we should introduce the plague amongst them. In one place they set fire to the bush to oppose our progress. The Apono have the custom of extracting always two of their upper incisor teeth; they are very warlike, but great drunkards. This is the last place

in travelling eastward that I found any knowledge of European goods or fire-arms amongst the natives; henceforward we entered the domain of the purely primitive tribes. Next to the Apono came the Ishogo tribe, a gentle and kind-hearted people, who excel in the manufacture of cloth from the fine cuticle of palm-leaves.

In this interior region I fell in with a wandering tribe of dwarf negroes. They never labour, but lead a vagrant life, remaining but a short time at the same place. They seemed to be the lowest type of human beings I had hitherto met with. They trap game and sell it to the tribes among whom they are for the time living, in exchange for plaintains. They are of light brown colour of skin, and though very short in stature the men are well made and generally hairy on great part of the body. The hair of the head is much shorter than in the negroes of this part. The women, of whom I measured several, are from 4 feet 4 to 4 feet 5 inches in height.

We next entered the Ashango territory; the country becoming more and more mountainous and travelling more difficult as we advanced. The road was a mere narrow path through a dense forest, and we were obliged to march in single file, up hill and down, over rocks and fallen trees, which encumbered the path and made our journey with the loads we carried most toilsome. Part of our cargo was plaintains, for provisions, and these make a very heavy load. At the village of Mongon, in Ashango (265 miles by road from the mouth of the Fernand Vaz), I found the height by aneroid barometer to be 2472 feet above the level of the sea. Ahead of us were occasionally visible the summits of a higher range; but there are no plateaux—all is ascent and descent. The sky in this mountainous region was generally obscured with clouds, and a light gray mist veiled the summits of the wooded hills. There is no dry season, properly speaking, in this hilly region, as it rains more or less all the year round. The greatest fall of rain I observed was $6\frac{1}{2}$ inches in 24 hours. We frequently had to wade across streams, and were wet all day long. The Ashango were very hospitable to me, though they are a warlike people, and their porters were very exacting in their demands. The villages are larger than those of tribes near the coast; some of them a quarter or half a mile in length, and the houses are square at the ends, not round huts as in other parts of Africa. Some of the villages have as many as 300 huts. The villages are far apart, and are connected by the narrow forest-paths I am speaking of. I have no doubt Africa could be crossed by these narrow paths.

I was now getting forward on my journey very nicely. I was

beginning to hear of a large river ahead, on the banks of which live the Ashangui tribe, and had only to pass the Nyavi and Abombo tribes before reaching them. The slaves exported by these two tribes do not come down to the sea this way, but down the Congo River.

Everything was looking hopeful. Wherever I went I was well received, when an unforeseen accident suddenly put an end to my further progress.

We had reached the village of Mooo Kombo, 440 miles from the mouth of the Fernand Vaz, and the porters who brought us from the last village had left us there. The villagers had received us very well, and we had been there four days vainly waiting for the chief to supply us with a fresh supply of porters. Being put off from day to day I told my men we had better leave the village, to show the people we were vexed. So we went and established our camp near by. As I expected, the next morning the old men of the village came and addressing themselves to my men, said, "What! shall the spirit sleep in the forest when there is a house in the village for him? Come again to us, and we promise to take you forward to-morrow." After they had begged several times, I consented to go back. The chief, Kombo, soon made his appearance, and in the course of a grand palaver explained that the reason why we were detained was that the people ahead were afraid of us, and did not want us to pass. If we had chosen another road, he added, pointing to the north-east and south-east, there would have been no trouble. "Eat this goat and plaintains to-day," said he, "and to-morrow you shall be off."

Soon after the palaver was over my attention was drawn to four men entering the village. Kombo sent word to me to hide myself, as these belonged to the very people who opposed my passage through their district. At the same time he told my men to make them afraid by firing their guns. I scarcely knew what was going on until I heard the discharge of a gun, followed soon after by another. I then saw the people flying in all directions, and the chief came to me and exclaimed, "You say you do not come here to kill people; is not this the body of a man?" The gun which one of my men had fired had accidentally killed a man, who died without a struggle.

At once I saw the gravity of my position. Every villager had disappeared. I shouted to them to come back, for we had not killed the man intentionally, and I would pay the price of twenty men if they would let us have a friendly palaver. To back up my words I began to spread before me goods and presents, and some

few of the bolder men came forward saying, "Let us talk the palaver." But others said, "Let us have war; they have come to kill us." They did not agree amongst themselves, and knowing the negro character, I thought I could keep them in that mood for a while, and their excitement would soon be over. When lo! a woman came forward, tearing her clothes and crying out that her sister was killed. The shot which had killed the man had penetrated the wall of a hut and made a second victim. She was the wife of the man who wanted the palaver to be settled. So there was an end of all chance of peace. The war-drum was beat, and I could see emissaries starting off to call the people of neighbouring villages to the fight. They came all armed with spears and poisoned arrows. These events took much less time to occur than I now take to relate them. I ordered immediately a retreat, and stopped my men from firing, knowing that we were in the wrong.

We left the village in good order with all the more precious part of my baggage. Igala, one of my men, and myself were wounded, and the arrows were flying thickly around us, but I was resolved not to repulse the attack unless the villagers persisted in pursuing us.

After we had entered the narrow forest-path, a panic seized my men, and they began to throw away their loads in order to flee quicker. As I brought up the rear with the man who had been the cause of the disaster, I saw to my great dismay, my precious instruments, collections of natural history, photographs of scenery and natives, note-books and goods scattered in the jungle—the work of many months irrecoverably lost. My men threw away all that I most esteemed, but retained their loads of beads and other articles which they valued. They only stopped in their flight when forced to do so from sheer exhaustion. I received a second wound from a poisoned arrow, which pierced through the belt of my revolver and entered my side, but fortunately the poison was scraped from it in passing through the leather.

We had to run from 9 A.M. till 5 P.M., passing through three villages during that time, and we repulsed our assailants five times. We had another populous village, about one mile long, to pass through before reaching a friendly tribe, and being so exhausted we concluded that it would be more prudent to wait until its inhabitants were asleep, for then we might get through without fighting. We concluded to rest in the forest. My men slept, and towards midnight we rose. I sent scouts, who soon reported that everything was silent, and that all the inhabitants were asleep. We emerged from the dark forest, and when we came to the village

we gathered together, cocked our guns and resolved to sell our lives dearly if the villagers should attack us. Treading lightly, we went onward, passing house after house, and sometimes hearing the natives talk among themselves. In one place they were playing inside the hut on the harp, but did not hear us pass. There remained only a few houses to pass, when suddenly a bonfire was lighted, and we then thought we should have to fight our way. At this moment a man appeared, and I recognised his voice to be that of the chief with whom I had remained a week on my way into the interior. He said, "I hear a noise, perhaps you are the people of the white man; go on, we have no war with you." How glad I was to hear these words! But preserving silence, and still fearing treachery, we went onward through different paths. About four o'clock in the morning we came to a cassava-field. We ate some of it, though it might have proved poisonous, for cassava before being fit to eat must be soaked in water for a few days. My men rested for an hour, and then we proceeded once more towards the coast. I reached the mouth of the Fernand Vaz at the end of September. I was then in rags and penniless, but fortunately I found a vessel about to sail for London in a few days.

M. DU CHAILLU, at the conclusion of his paper, addressed the President as follows:—"And now that I have done, I should do violence to my feelings, Sir Roderick, were I to restrain the promptings of my heart and omit to thank you for your kindness and for the friendly feelings which you have always shown towards me. How often did I remember your encouraging words when cares and sorrows fell heavily upon me! For I knew that if I returned I should find in you a true friend; and I am sure that I express the feelings of all travellers who are toiling in distant lands when I thank you, in their name and my own, for the hearty support you are ready to give to us all."

M. Du Chaillu's paper, with a Map founded on his observations, will be printed in the 'Journal,' vol. xxxvi.

The thanks of the Society having been voted, the PRESIDENT then spoke as follows:—"It gives me sincere pleasure to find that you have received the communication of my friend M. Du Chaillu with your warm approbation; for certainly he has shown the truest devotion to the cause of geographical research. Yet, in all his exciting narrative, he has said very little of the difficulties he had to overcome before he landed a second time on the shores of Africa. Now, in speaking of him, I wish you to recollect that although the former remarkable work of the ardent explorer was supported by myself, Professor Owen, and others, as being essentially truthful, yet it was known that it was harshly treated by certain critics. The author, deeply feeling the injustice of these criticisms, resolved to repair once more to the scene of his former labours,

but not before he had by study made himself master of those powers of observation which would enable him to fix the longitude as well as latitude of the places he might visit. Thus instructed, he devoted the greater part of the means he had accumulated by the sale of his 'Equatorial Africa' to the purchase of such a cargo of goods, weapons, photographic apparatus, dresses, and presents for the natives, as would enable him to succeed. His object was one of the grandest description, for it was no less than to penetrate through the mountainous region of Western and Central Equatorial Africa, where no traveller had ever set his foot, and to reach, if possible, some of the Western sources which feed the great reservoirs of the Nile; or, failing in that, of endeavouring to determine, at least, the origin of the great River Congo. You have all heard how, when he was advancing successfully and after he had made many astronomical and other observations, an unlucky accident brought upon him the calamities by which his enterprise was cut short. But even as they are, his results are of considerable importance; for he has not only corrected the geography of his former field, but advanced about 150 miles further into the interior than on the previous occasion. The courage, self-reliance, and perseverance shown by this traveller when alone among barbarians, and surrounded by terrible difficulties, are worthy of our admiration; for, whether we look to the prostration of all his followers by disease, and the dreadful visitation which had afflicted the native tribes—to his judicious conduct as long as peaceful intercourse could be maintained, or to his unshaken gallantry when a struggle for life became inevitable—in all respects I recognise in M. Du Chaillu a true type of the country which gave him birth; and if France has just right to be proud of him, we also, as well as our kinsmen the Americans, among whom he has also lived, may claim him as our own."

Professor OWEN said that the part of the world which M. Du Chaillu had endeavoured to explore was one of the most difficult that now remained to be opened to our knowledge. It was most inimical to human life, and full of conditions that demand the most indomitable spirit in an explorer, united to a constitution of iron mould, fitted to endure trials and to come out successfully from such a field of research. We must not expect that he can have much to say with regard to his zoological researches during this last journey, owing to the unfortunate circumstances under which his travels came to an untimely close. But he (Professor Owen) would not have the audience suppose that M. Du Chaillu's second journey in Equatorial Africa had been entirely without its fruits for Natural History. It was a characteristic of this traveller to omit no opportunity to observe and to record what he saw of the habits of the strange forms of life that he met with in these unexplored forests; and it was also his habit to take every possible pains to collect and to transmit, for the purpose of the systematic naturalist, those objects which he thought would be of service. The results of these endeavours he might briefly sum up to be these:—First, the most complete set of illustrative specimens of that most extraordinary animal, the gorilla, for the true knowledge of which we are in a great measure indebted to M. Du Chaillu. We have now in the British Museum a finer skin of a great old male even than the first which he brought over, and which until we received the second was the only true grand exponent of that colossal, massive, and diabolical-looking quadrumane. With the male, we have now several specimens, sent on this second voyage, of the female and of the young of different ages, all of which aid in enabling us to complete the Natural History of the gorilla. We have received from him, I think, the largest example of that curious exception among mammalian quadrupeds, the scaly lizard, as it is called in old works of Natural History, but a true warm-blooded animal of the genus *Manis*, adapted to feed upon the hosts of termites which abound in the part of Africa in which M. Du Chaillu travelled. If it be not a rare variety, it may prove to be a new species of *Manis*. In his first book he made known to us the remarkable habit

of that smaller anthropoid ape, the chimpanzee, in constructing complex nests in trees—rivalling in size the nests of the great ape in which it takes its repose. He has transmitted one of these to us, and we have it now in the British Museum, enabling us to give a description of his first description. In his first voyage he also made us acquainted with the habits of a small otter-like animal, which he observed, in some of the small tributaries of the rivers, darting with singular velocity after fish, which constituted its food. From these habits, and from what he observed of its structure and dentition, he conceived it to be a true carnivorous, or piscivorous, aquatic mammal, and he gave to it the name of *Potamogale velox*. Unluckily, the skeleton and skull of that particular quadruped were lost on his first journey, and he was able to bring home only the skin. The skin was exhibited and remarks were made upon it at the Zoological Society. It was said, "Here is an instance of M. Du Chaillu's animal is introduced to us as an aquatic species of Carnivora; but from the character of the skin that it is a Rodent—a guinea-pig, or something of that kind." The name of *Mythomys* was proposed for the animal in commemoration of the supposed fabulous statement. M. Du Chaillu said if he went to Africa again he would send them a *Mythomys*, and they would see whether it ought to be called *Potamogale velox* or not. An entire specimen preserved in spirits had since reached this country. He (Professor Owen) thought it perhaps a fortunate circumstance that he himself was not the recipient of the *pièce de conviction*: it was sent to the Professor of Natural History in the University of Edinburgh, Professor Allman, who had written to him to say that M. Du Chaillu was quite right; the animal was a true carnivorous quadruped; M. Du Chaillu had assigned to it its right office in nature, and the name which he had given it would remain. M. Du Chaillu had also sent home large collections of invertebrate animals, to assist in completing our knowledge of the fauna of this rich portion of Tropical Africa, including a very extensive series of the Diurnal Lepidoptera. These things cannot be collected and preserved without unremitting industry, and they are evidences of a real hard-working traveller. He had never supported M. Du Chaillu in the sense of an advocate. He had no personal acquaintance with him when he first came to this country. His first letter to him was one of pure business with reference to the gorilla. He had closely scanned every line that M. Du Chaillu had written on the habits of the gorilla, and if there had been any habit ascribed to that animal which was irreconcilable with its structure, he should have detected the error from the knowledge he had been previously able to obtain of its conformation. But he could not find one: on the contrary, every statement concurred and agreed with those characteristics of the gorilla in which it differed from every other species of anthropoid ape. The well-known case of the harp with strings of vegetable fibre was another instance of the unjust attacks made upon the traveller. It was averred that no harp, with tunable strings, could be made of dried grass or vegetable fibre. M. Du Chaillu said he would send one home, and he had now done so. It was found upon examination that the strings were really made of vegetable fibre, and were capable of producing musical sounds. On the points, therefore, on which M. Du Chaillu had been most severely criticised he has turned out to be correct; and on that ground they were bound to receive his evidence and to give him credit for accuracy. His statement that there was a cannibal tribe of blacks had been confirmed by Captain Burton. The only point on which he was assailable was, unquestionably, the figure of the gorilla which appeared in his first book, which was taken from a copy and not from his own specimens. The reason was because the publication of the book could not be delayed to allow of the production of an original plate from his best specimen, then under the hands of the taxidermist,

and now in the British Museum; therefore the best possible figure that could be got was put by the publisher into the book. The source ought to have been acknowledged; but in books of that kind such acknowledgements are not always met with, and the haste of publication offers ground of excuse. A similar instance occurred in Mr. Ellis's book on Madagascar with regard to the figure of the Aye-aye. Mr. Ellis did not possess a specimen, and the best possible figure extant was therefore given, taken from a work previously published, but not acknowledged. M. Du Chaillu's fault was equally venial, and as easily explained. The amount of work which M. Du Chaillu had accomplished during the time he was out, and in so extremely difficult a country, entitled him to great credit. We owed a debt of gratitude to every man who toiled, amidst disease, hunger, and danger, in these trying climates, in order to send home collections to our museums, and to add to our knowledge of the wonders of creation.

The PRESIDENT remarked that M. Du Chaillu had sent one of the native harps to him, and he had deposited it in the hands of the finest lady harp-player that he was acquainted with, the Duchess of Wellington, who has assured him that musical sounds may be produced from it, though the strings are made of fibres of grass. It was also important for geographers to know that the astronomical observations made by M. Du Chaillu were correct. They had been sent to Greenwich for computation, and he would call upon Mr. Dunkin, of the Royal Observatory, to testify to their value.

Mr. EDWIN DUNKIN said he had been astonished at the multitude and accuracy of M. Du Chaillu's astronomical observations. He had employed a computer nine hours a-day for ten days, and he had given six hours a-day himself to the task, and they had only been able to go through one-half of the calculations. This would give some idea of the immense amount of labour which M. Du Chaillu had gone through with regard to astronomical observations, and he could therefore add his Professor Owen that M. Du Chaillu must be a most traveller. He had at present been able only to cor latitude, those for longitude being as yet in course of computation. He might say, however, that the number of the observations taken at certain points enabled us to fix their geographical position with great accuracy. He would instance *Mayolo*, in the Otando country, as one of these places. At this station, no fewer than thirty lunar distances were observed for the determination of the longitude.

Mr. W. WINWOOD READE had passed, in 1862, nine days at Goumbi, on the Fernand Vaz; he had also been among the Fans, almost at the same time as Captain Burton, though in a different part of their country, and they both found that M. Du Chaillu had truly stated that these people were cannibals. He also made inquiries about the harp of vegetable fibre, and found that what M. Du Chaillu had stated was correct. When at Goumbi he made inquiries respecting the difficulties of going into the country, and he came away with the conviction that it was utterly impossible for any white man to penetrate more than four days' journey into the interior. He ventured to say that nobody except M. Du Chaillu could possibly have done it, and he was enabled to do it from having formerly traded a long time in the river, and from his knowledge of the native languages. Traders are the only people who have influence among the tribes. With respect to the gorilla and its habits, he would not go into that question; he would only say he adhered to the opinions which he had formerly stated at the Zoological Society, and should always be ready to defend them.

Mr. HARRIS said he had been living for several years on the coast near Sierra Leone, and could confirm M. Du Chaillu's statements with regard to the native harp, which was also used in that part of the country. specimens home himself. With regard to the *alumibi*, a very similar practice prevailed in the Sherboro district: the natives did not keep the remains of their

ancestors in their houses, but when they were going on a journey, or to do anything of importance, they always sacrificed to the remains of their forefathers. As to cannibals he had met a tribe, called the *Bushy*, who were eaters of human flesh, and he knew them to pack the flesh of their prisoners in hampers similar to that shown by M. Du Chaillu, and carry it some days for the purpose of food. With regard to the small-pox, he would ask M. Du Chaillu if the natives inoculated for that disease?

M. DU CHAILLU.—No.

Mr. J. CRAWFORD said he agreed with nearly all that M. Du Chaillu had stated; but with respect to the dwarfs forming a distinct tribe, he confessed he could not admit that part of his narrative. He would ask M. Du Chaillu if it was not possible that they might belong to the same race as the tribes around them, and had been expelled from the villages because they were dwarfs, in the manner that prevails among some Eastern nations: as in the case of lepers, who are confined to villages set apart for them, a practice followed also by the Jews under the Levitical law? But M. Du Chaillu had not stated whether these dwarfs differed from the surrounding tribes in any other respect than in stature, or whether they spoke a different language.

M. DU CHAILLU said the natives of Equatorial Western Africa have longish woolly hair, while these dwarfs have very short hair on the top of their heads. They look like the Bushmen of South Africa. It was difficult to say more. They were so afraid of him that he could get very little information, but he had carefully measured several individuals and had recorded the observations in his Journal, which would soon be published.

Fifth Meeting, Jan. 22nd, 1866.

VISCOUNT STRANGFORD, VICE-PRESIDENT, in the Chair.

PRESENTATION.—*J. H. Lydall, Esq.*

ELECTIONS.—*John R. Andrews, Esq.; Henry Walter Bates, Esq.; Algernon S. Bicknell, Esq.; Samuel Bowring, Esq.; Francis Collison, Esq.; Frederick E. Davis, Esq.; Charles Henry Gatty, Esq., M.A.; Richard Musgrave Harvey, Esq.; Archibald J. Little, Esq.; J. H. Lydall, Esq.; James Dyce Nicol, Esq., M.P.; T. Valentine Robins, Esq.; Captain W. Rooke, R.A.; Charles Sholl, Esq., C.E.; Arthur Keppel Cowell Stepney, Esq.; Alfred Wilkinson, Esq.*

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, JAN. 8TH, 1866.—‘*Victoria Falls, Zambezi River*,’ folio, by Thomas Baines, Esq. ‘*Verba Nominalia; or Words derived from Proper Names*,’ by R. S. Charnock, Esq., PH.D. ‘*Sur la Structure en éventail du Mont Blanc*,’ par M. Alphonse Favre. All presented by the Authors. ‘*An Accurate Description of Persia, and the various Provinces thereof*,’ date 1673, by John Ogilby, Esq. Presented by John Power, Esq., F.R.G.S. ‘*A History of the Island of Dominica*,’ by Thomas Atwood, Esq. ‘*Histoire de l’Égypte sous le Gouvernement de Mohammed-Aly*,’ par M. Felix Mengin. Both added to the Society’s Library by purchase. Continuations of Journals, Transactions, &c.

ACCESSIONS TO MAP-ROOM.—A Map of Metropolitan Railways and Improvements. A Map of the Thames Embankment and proposed New Streets. Presented by E. Stanford, Esq.

The CHAIRMAN said, before the Secretary read the papers he had an important communication to make, which had been entrusted to him by the President of the Society, whose absence that evening he regretted. It had reference to the search which it is proposed to institute for further traces of that gallant and distinguished explorer, Dr. Leichhardt, or for remains of his expedition. The first journey of this great traveller, for which he received the Gold Medal of the Society, was undertaken from the then nascent colony of Moreton Bay, now called Queensland, towards Port Essington. Subsequently, in 1848, he undertook the colossal geographical exploration of the whole of the Australian continent from east to west—from the Pacific to the Indian Ocean. From his very first start on that expedition down to a very recent time, no trace whatever has been found of him. The present project of search had originated in consequence of certain discoveries which had been made by Mr. McIntyre, who, in traversing the continent in search of pastoral lands from south to north, had lighted upon two marked trees on the banks of the Flinders River, which had given rise to the idea that the search for Leichhardt would not be a hopeless undertaking. The proposal has been taken up by three of the Australian colonies in a national sense, and each colony has subscribed in the most munificent manner towards the expedition. The project of search has been received in a similar way, nationally, to that with which we took up the search for Sir John Franklin. By an unanimous resolution the Council of the Royal Geographical Society have subscribed 200*l.* out of its funds in order to assist. This expedition has already started from Melbourne, under the leadership of Mr. McIntyre, who, from his previous experience in Australia and his general ability, if any man in the world can do it, seems to be the man who would lead it to a successful termination. The President, Sir Roderick Murchison, is most warmly interested in the matter, and had desired him to announce that a public subscription would shortly be opened at the Society's rooms, and also at Messrs. Coutts, and Messrs. Cocks and Biddulph, bankers.

The following papers were read:—

1. *Description of the District of Cape York, Australia.* By JOHN JARDINE, Esq., Police Magistrate, Somerset, Cape York.

THIS paper was a detailed description of the neighbourhood of Somerset, the new settlement at Cape York, built on the shores of the channel which separates York Peninsula from Albany Island in Torres Straits. The peninsula proper is a tract of land about 15 miles in length, separated from the rest of the mainland by Kennedy River, which stretches nearly across the neck of land between Newcastle Bay and the western coast. The land is hilly, and in the valleys the soil is a reddish loam, more or less sandy; but on the ridges luxuriant vegetation and beautiful flowers cover the large blocks of ferruginous sandstone. Very little of the land is suitable for agriculture; the grass is long and coarse; horses and cattle keep their condition fairly, but the country is quite unsuited to sheep; goats may be kept with advantage, and pigs find an

abundant supply of food in the scrubs and swamps. The climate is dry for eight months of the year; the rainy season lasts from December to March inclusive, and this is the hot season, the thermometer reaching sometimes 98° in the shade. But, during the dry season, a fresh bracing breeze from the south-west blows almost continually, and the thermometer averages during the day from 80° to 85°. The climate is perfectly healthy; there is no local malady, even in the wet season, and the author considers that the new settlement will hereafter become a sanatorium for invalids from India and China. The author gave also a most interesting description of the aborigines, of which four distinct tribes inhabit the district.

The paper will be printed entire in vol. xxxvi. of the 'Journal.'

2. *Explorations in North-Western Australia.* By JAMES MARTIN, Esq., M.B.

The chief geographical interest of this paper referred to the discovery and exploration of the mouth of the Glenelg River, by the party of which Mr. Martin was a member. The River Glenelg was discovered so long ago as 1838, by Captain (now Sir George) Grey and Lieutenant Lushington, and an attractive account of the region was given in the 'Journals of Discovery in North-West Australia,' afterwards published by Captain Grey. But neither of these explorers was able to reach the mouth of the river, nor had it been detected by our naval surveyors. The expedition to which Mr. Martin belonged was organised in 1863, by a committee of settlers in Western Australia, for the discovery of new pastoral lands in the tropical portion of the colony; and the party, consisting of four explorers, set sail in the schooner *Flying Foam*. It was not until many vain attempts and much delay, that the schooner succeeded in finding the mouth of the Glenelg, in the place where it was supposed to lie—namely, in Doubtful Bay. The difficult entrance from the sea led into a large expanse of waters (called "George"), all the channels out of which, landward, seemed to end in a passage choked up with mangroves. Land parties could, however, descend from the top of a neighbouring hill the river flowing towards the place; and the true mouth was, after six days' search, found in the north-eastern end of the George Water. The river for the first few miles flows through a rugged hilly country, and has many rocky islands in its channel. Its shores afterwards become flatter, but the navigation was difficult, owing to the great fall of the tide—28 feet—leaving the schooner aground always at low water. After

connecting their explorations with those of Grey and Lushington, the party examined the tract of country between the Glenelg and Camden Harbour, and reported favourably on its suitability for settlement.

This communication will be printed *in extenso* in the 'Journal,' vol. xxxv.

At the conclusion of the papers, the CHAIRMAN read the following extract from a letter of Admiral Stokes, who expressed his regret at being unable to attend the meeting :—

"I consider Mr. Martin's discovery of great importance, as it gives water-carriage to the good land that Sir George Grey (the discoverer of the Glenelg) speaks of having found on its banks. Such a mode of transit in so rugged a country must indeed be considered a great acquisition. Delighted as I always am, at seeing enterprising colonists taking up positions on the northern and western shores of Australia, I fear that success will not attend settlers on the north-west coast in the neighbourhood of Camden Bay; for, bountiful as Nature has there been in the way of harbours and in giving a great rise and fall of tide, numerous islets and outlying reefs give the coast a forbidding approach, added to which are the frequent calms which prevail. Nowhere does salubrity depend more on a certain fresh breeze than in intertropical settlements. I consider that the very rugged nature of the country, with its ovenlike valleys in the neighbourhood of Camden Bay, holds out but poor prospects for the proprietor of cattle and sheep."

Mr. CRAWFURD was of opinion that the tropical part of Australia, which constitutes about one-third of the whole continent, is not at all likely to be a fit place for the rearing and pasturing of sheep, or for European colonization. With respect to the temperate portion of Australia, although possessing a most salubrious climate, it is deficient in those grand features of physical geography which make a country fertile and capable of sustaining a great population. For instance, there are no great rivers in this vast region; there is no valley of the Mississippi; none comparable to that of the Ohio, the Danube, or the Ganges.

Sir CHARLES NICHOLSON here remarked that there were the valleys of the Murrumbidgee and the Darling, much larger than any of those which Mr. Crawford mentioned, except the Mississippi.

Mr. CRAWFURD, in continuation, said that the South Australians had planted a settlement at Adam's Bay, in lat. 12°, and never was failure more complete. The country in that part of Australia was totally unfit either for sheep or for Europeans. It was from that spot that a party of the settlers made the extraordinary boat-voyage of 1600 miles (of which we heard an account on a previous evening) in order to escape from it. Another attempt had been in lat. 15°, at Camden Harbour, the neighbourhood of which Mr. Martin said was favourable for depasturing sheep. Admiral Stokes, on the contrary, said it never will be fit for the depasturing of sheep. The summer-heat is from 98° to 120°, and is that a place for sheep whose fleece is required only for warmth? He had seen an account in a Dutch newspaper of a visit to the settlement paid by the English vessel *Jenny Orwell*, in the spring of 1865. The account stated that there were 100 persons there, and that the chief purpose of the experiment was the depasturing of sheep, of which about 5000 were taken to the place. The colonists were in a very desponding condition: a great many of the sheep had died from the effects of heat and want of food; and out of the 5000 a few hundred only remained, after seven months' residence. That report seemed to condemn Camden Harbour most completely.

Sir CHARLES NICHOLSON said, on one or two points he was happy to agree with Mr. Crawford. He thought, for instance, that the settlement at Camden Harbour was a most absurd enterprise. The first statement in the report of the survey of that district—namely, that there was only a million of acres of land—was at once decisive against the establishment of a colony there, when there are hundreds of millions of acres of land unappropriated in various other parts of the Australian continent. Besides, the very character of the grass, 6 feet high, was to any one accustomed to the rearing of sheep a sufficient proof that such a country is utterly unfit for the depasturing of sheep. This was the first occasion upon which he had really acquired a clear conception that a colony had been formed in that particular locality. With regard to Adam's Bay, no doubt there has been a great deal of wrangling and squabbling among the persons entrusted with the founding of that colony; but it remained to be proved that that country is not capable of profitable occupation in some way or other. That North Australia should be placed under the jurisdiction of South Australia is an absurdity for which the Colonial Office is responsible. That sheep will thrive within the limits of the tropics is a matter placed utterly beyond doubt. It is notorious that, at the present moment, there are within the region of the tropics not less than four or five millions of sheep depasturing; and thriving as well as in any part of the Australian continent. He quite admitted that further north the climate would be found incompatible with the healthy growth of sheep; but in those regions at the head of the Gulf of Carpentaria there is most luxuriant pasture suitable for cattle. With regard to the alleged want of fertile valleys, like those of the Mississippi and the Ohio, it is a fact that there are some of the largest rivers in the world in the south-eastern part of Australia, which, in the case of the Murrumbidgee and the Murray, are made available by steamers for a distance of 1200 miles. There is no doubt that these valleys will ultimately become the seat of a vast population. Again, on the east coast, the Fitzroy River drains an area of country as large as the whole of England. There are portions of Australia destitute of water, and not suitable for settlement; but there is the whole of the eastern and south-eastern portions, with capabilities equal to those of any portion of the globe.

Mr. CRAWFORD said he was aware of the existence of the Murrumbidgee and the Murray, but they have no outlet, and are, therefore, inferior to the great rivers in other parts of the world. No doubt, parts of the continent are fertile; but the fact that the Australians are fed by corn brought from California and Chili shows that the general fertility of the country is inferior. He had said that with respect to sheep there is no part of the world comparable to temperate Australia. The amount of wool imported, into this country alone, from Australia last year was 99,000,000 lbs., of the estimated value of 8,800,000£. He had also said that, within certain limits of the tropics up to, perhaps, about latitude 21°, sheep might thrive. But he maintained that the fleece deteriorated considerably in quality and quantity; already the fleece of Queensland is inferior to the fleece of Sydney.

The CHAIRMAN, in conclusion, said what we wanted in discussions of this kind was as little as possible of inferential argument and as much as possible of direct testimony. On the one hand we have the fact that a settlement has been formed in tropical North-Western Australia, the sheep being transported with the settlers by a long sea-voyage from Swan River, and we know that those sheep have entirely failed. On the other hand, we have direct testimony that sheep from Queensland and the temperate regions of Australia have been gradually transported by land into the sub-tropical and tropical portions of the continent, passing quietly and gradually through a grass country favourable to the pasturing of sheep, and these sheep have suffered no material deterioration and have most distinctly thriven. It is not in the competence of any man

at present to be able to draw a line, and say that at the tropic of Cancer, or at a line north of it, the pasturing of sheep stops and ceases to be profitable. The most that can be said is this—he was citing the opinion of Mr. Brodrib, quoted by Sir Roderick Murchison in his Annual Address—that sheep do most distinctly thrive which go northwards from Queensland to the tropics: not in the equatorial tropics, but in the less typically tropical regions on the north side of the tropic of Cancer. But the weight of the fleece does undergo diminution, and it has been found necessary to import fresh rams every two years from the temperate regions of Australia, in order to perpetuate the breed and enable it to produce wool at anything like a satisfactory profit. Still, if that can be done, it is so far an argument in favour of this gradual and tentative extension of sheep-breeding from Queensland northward. He wanted to point out the difference between that and the sheep which are transported, *per saltum*, by a long sea-voyage from south to north; and that, in this way, it is perfectly possible to reconcile the conflicting statements they had heard. He wished, finally, to explain that the new establishment at Cape York is neither an agricultural nor a pastoral settlement, but is founded by the Government of Queensland, in conjunction with the Home Government, chiefly as a harbour of refuge in connection with the navigation of Torres Straits.

Sixth Meeting, 12th February, 1866.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

ELECTIONS.—*E. Boutcher, Esq.*; *R. B. Byass, Esq.*; *S. Canning, Esq.*; *O. J. Crawford, Esq.*; *John King, Esq.*; *Lieut. H. Morland*; *J. H. Murchison, Esq.*; *Alex. Ramsay, Esq.*; *J. E. Saunders, Esq.*; *H. T. Sharp, Esq.*; *Rev. I. Wiltshire, M.A.*

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, 22ND JAN., 1866.—Portrait of the late Sir John Barrow, Bart., F.R.S., &c.; presented by John Barrow, Esq., F.R.S., &c. 'A Visit to the Plateau of Gusakan,' by Lieut.-Colonel L. Pelly. 'A Journey between Bushiro and Shiraz,' by Lieut.-Colonel L. Pelly. 'Memoir on the Gorilla,' by R. Owen, D.C.L., F.R.S., &c. All presented by their respective authors. 'Asia,' the first part; being an accurate description of Persia, by J. Ogilbie; presented by John Power, Esq., F.R.G.S. 'Notes of a Trip from Shanghai to Ningpo, *via* Loochow and Hangchow,' by C. Jamieson, Esq.; presented by Colonel Sykes, M.P., F.R.S. 'Gulielmi Pisonis de Indiæ utriusque Naturali et Medica,' presented by S. M. Drach, Esq., F.R.G.S. Continuations of Journals, Periodicals, &c.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING.—Map of Mauritius, or Isle of France; presented by Lieutenant Oliver, R.A. Chart of the Nicobar Islands, by Commodore B. v. Wüllerstorff-Urbair, of the *Novara*, Austrian frigate. An Atlas of the States of the Columbian Republic, by A. Codazzi; also a Map of the same Republic and a Map of the River Magdalena; presented by Grand-General T. C. de Mosquera, President of the United States of

Columbia. Nine sheets of the Topographical Map of Sweden, by Major-General J. A. Hazeliu8, chief of the Royal Topographical Corps of Sweden; presented through the same (2 copies). Admiralty Charts, 13 sheets. Ordnance Maps, 140 sheets.

The PRESIDENT said the subject of the paper about to be read was one that had excited great interest in Germany, and he was sure that it would do so in England. It was an account of the calamitous termination of the Baron C. von der Decken's expedition on the River Juba, on the east coast of Africa. It was well known that the Baron had devoted a great part of his private fortune to the equipment of his expedition, and that it was his intention to ascend this almost unknown river as far as practicable in his two steamers, and then to cross Africa towards the eastern affluents of the Nile. The Baron C. von der Decken had previously distinguished himself as an explorer in penetrating to Kilimandjaro, and for his services had received the Gold Medal of the Society. He had on the expedition provided himself with two iron steamers, which were taken out from Hamburg, in sections, in a ship to Zanzibar. At Zanzibar he employed seven months in organising his party, and the services of our naval squadron on the African station were placed at his disposal by direction of the First Lord of the Admiralty, the Duke of Somerset, who, as well as the Geographical Society, had taken the greatest interest in the success of the expedition. Colonel Playfair, our Consul at Zanzibar, who was now in England on leave of absence on account of his health, and present on this occasion, would tell them how well the expedition was provided for its purpose. The naval officer whom the Baron placed in command of his vessels was selected from the Austrian service, and there was attached to the expedition a medical officer and botanist, an artist, European workmen—in short everything was done to ensure success. The Baron lost his small steamer at the mouth of the Juba, and one of his party, a European, perished with it. The large steamer fortunately passed the bar, and ascended the Juba—a river that has never before been ascended by Europeans—a distance of 380 miles. It then struck on a reef, and was obliged to be unloaded, the Baron proceeding to take measures for the safety of his people and his vessel. Taking Dr. Link, one of his party, with him, he redescended to Berdera, a town on the banks of the river which he had passed on his way up, with the view of obtaining assistance. In the mean time, the party he had left behind, under command of Lieutenant von Schickh, were attacked by a large party of the natives. Fearing for the safety of his chief, M. von Schickh descended the river as quickly as possible in the only boat that was left, in the hope of finding Arab vessels at the mouth of the Juba to take them to Zanzibar, a distance of 350 miles, there to procure assistance for the relief of his chief. This he accomplished, and, in addition to the efforts made by him, it appears that a ship in Her Majesty's service had proceeded in the direction of the Juba with the view of affording all the aid they could to M. von Schickh in his search for his associates. The first news he (the President) had of this disaster was in a letter from Baron Jules de Decken, brother of Baron Charles, on the 31st of last month, and he of course felt it his duty to go at once to the Admiralty to ensure that additional succour would be afforded. The Baron Charles von der Decken, he ought to explain, was entirely under British protection; but our Consul being on leave of absence, and his deputy being unwell, the accounts have come to us through Germany; the Hanseatic Consul at Zanzibar having forwarded the news. In Prussia the disaster has excited the most intense interest, as the Society had learnt through one of its associates, Colonel Beauchamp Walker, who had been the medium of forwarding copies of the documents from the Princess Pless, mother of the Baron. The

Meeting was fortunate in having present Colonel Playfair, Consul, and Colonel Rigby, our former Consul at Zanzibar, who were both well acquainted with the natives and with the languages on the Somali coast between Aden and Zanzibar, and could give their views of the probable chances of escape of the Baron and Dr. Link.

COLONEL RIGBY then read the following:—

1. *Report on the Disasters that have happened to the Expedition of the Baron Charles von der Decken.* By Lieutenant the Chevalier VON SCHICKH.

(Communicated by the PRINCESS VON PLESS, through COL. BEAUCHAMP WALKER.)*

THE report which the Chevalier von Schickh laid before the Hansatic Consul commenced with a few short extracts from the journal of the Baron himself, giving the dates of arrival at the different villages on the banks of the river, and describing the accident which brought the voyage of the steamer to a termination a little beyond the town of Berdera. The extracts commence on August 16th, the day after the expedition entered the Juba. Nothing of importance appears to have happened until they arrived at Berdera. The journal of the Baron then proceeds as follows:—

“About 11 A.M. we passed close to Berdera. Abdio, the two Barakas, and Kero landed to go up to the town, which is somewhat higher on the left bank, in order to procure provisions and deliver the letters of introduction that we had brought. About five o'clock, happily free, I proceeded with Link in the boat to inspect the stream; the steamer followed slowly. On the right bank, at the town,† I was challenged to stop. As there was no good house, I proceeded about 1000 paces further up to the first town on the left bank. Abdio and his associates stood on the shore, but I declined to avail myself of the anchorage pointed out by them opposite the town, as we should there be too much commanded by the hills. Accordingly, we cast anchor close to the exterior walls, exactly opposite the watering-place, where the ground was flat. Groups of inquisitive people remained on both sides of the river, even during the night.

“20th.—Abdio and suite came on board about half-past seven. They had not procured any provisions, but they brought the evidently false intelligence that at only two hours' distance from Berdera the Juba has a great cataract, and that the people of Berdera and Gumana are at war. He is a very useless creature, yielding to every native rumour, and is cowardly beyond measure.

* Translated by S. M. Drach, Esq., F.R.C.S.

† There are two towns at this place, separated by the river.—Ed.

I landed at nine o'clock. The sultan, or rather sheikh, is *Hamadi ben Kero*. The most wealthy man is the so-called brother of Sheikh Sigo, of Brava Amri. Both were very polite, and full of pleasant speeches. A bullock was sent on board, and milk, fowls, eggs, and a bag of m'tama [millet], were placed in my boat. The chief of this place appears to be a person of little importance. The information I received, if not very favourable, was at least more encouraging than that which Abdio, who understands the Somāli language, had obtained. They could not, however, describe where the cataract was situated. Hostilities exist between the opposite town and Gumana, but they themselves are in profound peace. The town is surrounded by a wall, ruined in many places, with a moat beyond it. The people are strict Mahomedans, and neither smoke nor take snuff. Even Hamadi ben Kero would not come once into his own house while I was sitting there smoking. The people are armed with spears and very nicely cut rhinoceros-hide shields. One seldom sees bows and arrows, and never fire-arms. Their hair is parted, but sometimes it is allowed to grow long and hangs down about a foot in length all round the head. An arrow-shaped comb is sometimes stuck into it.

"21st.—Went, at 9 A.M., with Abdio and Amio to the town on the right bank. The chief and inhabitants were friendly; they had goats killed for the people with me, and presented me with an ox. It was quite impossible to effect any barter with them, although they offered goats for sale. For a sheep they asked four dollars, and other things were proportionately dear. In the afternoon again went to the town; for to-morrow a hunting-party has been arranged, and for the day after an excursion to the cataract. There was a report in the town that a second steamboat was ascending the river, and had already passed the Wasegua villages.

"22nd.—In the morning early went hunting; later we went to the town. The people on the other shore had crossed over with their sheep and goats to bargain afresh. Naturally, another failure. I committed the great fault of telling the people that I would not allow myself to be cheated, and that they were as bad as thieves in thus raising their prices; but, to show them that I did not care for the cloth, I gave a piece to each of the two chiefs. Abdio again behaved so stupidly to-day that even Kero came to me, and said that through his foolish conduct some unpleasantness would arise with the people.

"23rd.—Yesterday, Hamadi ben Kero had promised to give us from eight to ten bags of m'tama [millet]. I told Abdio to receive them, but, with his usual abominable indolence, he preferred en-

joying himself instead of doing my work; therefore, neither chief nor m'tama appeared to day. Amio, who in spite of all his fine words makes common cause with the others and Abdio, is no better. During our stay here he bought only a single sheep, while I bought three, and at a cheaper rate than his. In the afternoon, when I went into the town to measure the m'tama which had been cleaned by the people, I was informed that Hamadi ben Kero had given orders that no provision should be sold to the Europeans, and Abdio came to me with a verbal message that the Sultan wished me *bon voyage*.

"I returned on board with all my people, who had been in the town, and sent Abdio on shore to bring Amio, who generally manages to keep away when any unpleasantness is apprehended. After an hour Amio really did come on board, and declared that he had business which would take him away from the town for a few days, that he knew nothing of the affair, and he offered himself to procure the desired provisions. He further said that Hamadi, though he was sultan, had not the power to give such orders, and that he himself, being a Brava man, was the equal and superior of the sultan, who was but a simple Somāli. He promised to bring sufficient provisions on the morrow, and to force Hamadi to apologise. I therefore left him unfettered.

"24th.—Went on shore at 9 A.M., when I found three oxen; one was to be given to me as a present, and the other two for a consideration. I also got 100 measures of m'tama in the village. In the afternoon Hamadi ben Kero came to ask pardon; he gave no reason for his behaviour of the previous day, except that he thought the devil had possessed him. He placed his turban on the ground, and offered his hand to me in token of reconciliation: this, however, I refused to accept, to his great astonishment, as he thought he was doing me an honour.

"I sent, through Abdio, a present to the sultan and to Amio: to the former eighty yards of American cloth, and to the latter five dollars.

"25th.—We left at 6 A.M. As might have been expected, the bullock and cow left on shore did not come on board. At about 11.8 A.M. we cast anchor on account of the rapidity of the stream.

"26th.—Started about 2 P.M., and when directly below the rapids, although we were going so slowly that we were hardly conscious of being in motion, we struck a rock, and immediately afterwards our stern struck on another. The engineer, Kanter, called out immediately that the ship had sprung a leak, and we saw the water rushing in under the boiler. After bringing the large boat from the

island we commenced to unload, and by 5½ P.M. most of the cargo was on shore. Link, Trenn, Kanter, and Brinlemann slept on shore with six men and the dogs, to guard the goods and the sheep.

"27th.—I must say I think all we can do will be lost labour, and I give up the *Welf*. The only use we can now make of her is to break her up and construct a raft. We pitched nine tents on shore.

"After mature deliberation and consultation I have resolved on the following plans:—To-morrow morning early I will go, accompanied by Link and the guide, in my boat to Berdera. If we should there have authentic news that Livingstone is in the neighbourhood, I shall once again, with his aid, try my luck in the *Welf*. If not, Schickh is ordered to construct a boat with the materials of the broken-up ship. I will send provisions from Berdera to the rapids, and go on foot to Gumana, to see if it will be worth while to continue our voyage on the Juba without a steamer."

The following is Lieutenant von Schickh's narrative of events after the departure of the Baron:—

"28th.—The Baron left at 6 A.M. on the 28th, accompanied by Dr. Link, the Brava chief Abdio, two guides, Baraka and Kero (the last with letters and provisions to enable him to return by the 30th, at the latest, from Berdera), and four of our negroes.

"28th-30th.—On the 28th, 29th, and 30th, we continued to discharge coal and to work at the leak. On the afternoon of the 30th we had finished the unloading and had repaired the leak, but the river had sunk 2½ feet, so that we should have had, at any rate, to await a rise of the water in order to float the steamer.

"October 1st.—On Sunday, the 1st of October, I allowed the people to rest; the expected guide had not returned from Berdera.

"At 1½ P.M., after the negroes' dinner, we saw between the trees, on the other [left] bank, a great number of negroes. Thinking that this was the expected guide, escorted by some Berdera people with provisions, I sent the boat across with eight men and the boatswain. As he remained too long absent I called him back. The Berdera people told him that neither our guide nor a letter from the Baron was there, but that the Sultan of Berdera had sent them to remove our effects to the left bank, as we should be liable to attack on the right one. They gave no news of the Baron. The boatswain estimated their numbers at between one hundred and fifty and two hundred men. This seemed strange, for if the Baron were still at Berdera he would at least have written intelligence about himself; and if he had left Berdera the guide should have returned with a

letter and provisions. I therefore did not send any of our effects to the other bank, but ordered Brenner to cause the men, after their siesta about two o'clock, to fence round our encampment [on the right bank.]

"When the Berdera people saw that we did not act on their advice, first three, then three more, then many others, waded above the *Welf* and the sand-bank between this and the right bank, and thence again called out for the boat.

"I then sent the boat to the sand-bank to fetch some across, and to make further inquiries. On our people asking how many they might take, I allowed them to bring over six. No sooner had the Berdera people heard this than we heard the sound of a horn on the left bank, and from twenty to thirty negroes, with poised spears [on the right bank], rushed between the bushes and tents into the camp. All who were on this side of the camp, including M. Trenn, the artist, were cut off from their weapons and slain. Kanter jumped from his couch. He still had with him the gun which he had used in the morning's hunt; with this he fired two shots, when he also was massacred. Brenner, Theis, and Deppe, who first remarked the assailants on the north side of the camp, seized their guns, and kept up, especially Brenner, a steady fire, and hereupon the assailants retreated to the bushes.

"I now ran to my tent on the south side and fetched my gun and ammunition. Some blacks tried to get hold of the muskets before us, but retreated into the bushes when I attacked them. I then, with the four Europeans and two negroes (the others were either captured, or fled into the woods, or jumped into the stream), proceeded to the beach to get free play for our firearms. Thence we fired some shots at the people on the shore, who waited on the left bank. One jumped into the boat and allowed himself to be carried downwards.

"There was now no time to be lost, as with the boat would be lost our last chance of escape. I sent Brenner with one negro to swim to the *Welf* and bring the small jolly-boat; this he did. The whole party, consisting of five Europeans and seven negroes, got into it and rowed downwards to overtake our large boat. We overtook it at the moment that the Somāli was trying to fasten it to the left bank. A few shots drove away him, as well as the others, into the bush, and we had just time to enter it when the little one, much too small for us, sank.

"We rowed in this boat up to the camp, when I sent Brenner on shore with three negroes to fetch ammunition; the rest of us covered him with our firearms from the boat, as natives were still visible

in the woods. Thence we went on board of the *Welf*. I ordered Deppe to collect the papers, journals, and valuables of the Baron, Brenner to get ready the guns and ammunition, and Theis to look after the provisions. The Berdera people on the left shore had recovered the jolly-boat that had sunk, drawn it on shore, and had now crossed the river in it.

"We had now to consider our future course. Most probably the Berdera Sultan, learning our condition on the Baron's arrival through Baraka, and remembering the nature of his last interview with the Baron on the 24th of September, had put off the Baron for some time with promises; then, after holding a *showri* [or *divan*], either murdered him or at least kept him prisoner. Otherwise it is inexplicable that the Baron had not sent us any intelligence.

"Having then forced the guides of the Baron to acquaint them with the details of our position, or the guides having voluntarily given this information, they had formed their plans. While the guides were with us there were only Trenn, Brenner, and two or three negroes on shore, the others were all working at the *Welf*. The guns, ammunition, most of the muskets, and all the effects were on shore; the *Welf* lay ten paces from the left bank, which there rose to a height of from six to eight feet above her. Therefore they sent the greater part of their men from Berdera (about two hundred) higher up on the left bank: on the right bank there were only from forty to fifty. The former party could fully command the *Welf* from the high bank, whilst it was easy for the others to finish off the two Europeans and three negroes on the shore. On their arrival they found themselves disappointed; we had rested from our labour on account of it being Sunday; we were all on shore, and they could not cross the river, as there is only one ferry which is at the town. Their object therefore was to divide us, so that they might the better carry out their project. But when they saw that we made no preparation to carry out their advice, they waded to the sand-bank and again called out to us to send the boat to ferry them across, so as to strengthen their party on our shore. When I gave orders that only six people should be allowed to enter the boat they gave the signal to attack us, as a longer delay must have made us suspicious. That the attacks from both sides of the river were in concert is evident, since those on the left shore chased our men from the boat and seized it. All our negroes declared the assailants to be Somalis, whom they can distinguish from the Gallas both by their language and general appearance; some even fancied that they recognised Berdera people. After the attack many went in the jolly-boat from the left to the right bank. If, then, the assailants were

Berdera people, it only remained for us to consider whether we should wait a few days longer, to learn, if possible, something of the Baron's fate, or at once break up. As to getting the steamer afloat, that, under present circumstances, with our few hands, was not to be thought of. Still less possible was the scheme of descending the river on a raft. On the other hand, it was certain that the least delay would cause the news of our disaster to precede us, and then we should have to expect hindrances and opposition everywhere on the river. This would not have mattered much so long as we remained on the river, but on our arrival at the mouth we should have had to go on shore and surrender ourselves to the tender mercies of the Juba people. Moreover, independent of our own personal safety, the fate of the Baron (if he were still alive) depended on our freedom. For, while the people knew that we remained safe, they would try to escape punishment by preserving the Baron. If we were destroyed it would be easy for them to declare that it was not them, but the Gallas, that had destroyed the expedition.

"Any attempt on our part to ascertain by force the fate of the Baron, or to render him assistance, was impossible, owing to the overpowering numbers of the enemy; neither would an interview have availed us, as neither we nor any of our negroes understood the Somāli language. I therefore determined to abandon the wreck and obtain at Zanzibar help, either to afford assistance to the Baron or at least to learn his fate.

"But being desirous not to take such a step on my own responsibility I asked all the others for their advice, and they were unanimously of the opinion that we had no alternative. Therefore, having taken weapons, ammunition, money and valuables in our boat, we again returned to our camp, took in provisions and other necessaries; and forsook the locality. We had not room aboard to bring the instruments with us. By rowing day and night with a single pair of oars we managed to reach the mouth by 2 A.M., on the 7th October. We there left the boat, as it would have been impossible to cross the bar. Thence we commenced our journey on foot, in the hope of reaching Kiama, where we hoped to be able to hire a boat for our further voyage.

Fortunately, after four hours' march, we found a dhow at Cape Bissell, manned by four negroes; this I hired, and on the 16th October we arrived at Lamoo, where we got another dhow, which brought us to Zanzibar on the 24th. Here I hoped to find an English or French man-of-war to take me to Brava, whence my intention is to march by the caravan road and obtain intelligence

from Berdera. Disappointed in this expectation I am forced to go to Brava in a dhow."*

Colonel PLAYFAIR said that on quitting Zanzibar he left the political agency in charge of the medical officer, who had since been obliged to go away for the benefit of his health. But before leaving, Dr. Seward had made over his charge to the Hansatic Consul; and this was the reason why the news of the disaster had reached us through the Consul, instead of from the British Consul at Zanzibar. Regarding the equipment of the expedition, consisting of two vessels; one a large river vessel of 120 tons burthen, drawing perhaps 4 feet of water, the other a steam launch, of from 10 to 15 tons burthen, with an engine of 2-horse power. The launch was lost on the bar at the mouth of the Juba; the other vessel succeeded in ascending the river, as we had learnt from the report just read. Had it not been for the attack on Lieutenant von Schickh the vessel might have gone much further up the river, for they had succeeded in repairing the leak sprung in striking on the rocks. He had the pleasure, whilst at Zanzibar, of living on the most intimate terms with the members of the expedition. The character of the Baron von der Decken is well known to the members of this Society. M. von Schickh, an officer of the Austrian navy, was the second in command, and upon him would naturally devolve the conduct of the expedition in the event of anything happening to his chief. He knew no one who would be less likely to desert his post than Lieutenant von Schickh; and we in London could not form an adequate idea of the difficulties of his position, which rendered his retreat necessary. In the midst of dangers, surrounded on every side by hostile tribes, he had not a single man attached to his party who could speak the language of the country. There was no doubt the tribes among whom they had fallen belonged to the Somali race. With regard to the assistance given to the Baron von der Decken at Zanzibar, he must confess he was unable to do much himself personally, but he saw an officer in the room, Captain Allen Gardiner, of Her Majesty's Navy, late senior officer on the East Coast of Africa, who had rendered the Baron great assistance, sending parties of men from the vessels under his command to work, in the broiling sun, from morning to night without any protection over their heads. He was sure the Baron and every one in his expedition would acknowledge the great value of the assistance they received from him. In the fact that the Baron had fallen into the hands of the Gallas, lay the only ray of hope for his safety. Had he fallen among the Gallas, his fate would have been instant death. The Somalis are a peculiar race. He had lived for years in close contact with them, and he had known them to perform some exceedingly generous acts. The crews of vessels wrecked on the coast had been treated with the greatest hospitality by the Somalis, sent from village to village along the coast, and at last had been sent to Aden, or the authorities at Aden had been communicated with, and they had sent means to bring them forward. He remembered on one occasion going to investigate the alleged piratical seizure of a British vessel; upon approaching the shore, a boat full of English sailors came off, and told him they had been wrecked at Rus Hufoon, and had been passed along from village to village, and treated with the greatest kindness by the natives. It was true instances to the contrary had occurred; but where massacres had been committed upon British subjects,

* M. Schultz, the Hansatic Consul, states, in a brief abstract which he forwarded of the above report, that an English vessel of war had departed from Zanzibar for Brava to aid the travellers, on the 11th of November.

it had in almost every instance been brought about by a misunderstanding on the part of the sailors as to the intentions of the natives. Such was the case when the boat's crew of the *Penguin* were massacred on that coast. He believed Baron von der Decken might still be in safety; but there was no such hope for poor Trenn, an artist of the greatest promise who had endeared himself to all at Zanzibar by his amiability and gentleness: he was one of the first to join that noble army of martyrs who had given their lives for the advancement of geographical science.

The PRESIDENT remarked that the Baron von der Decken had expressed to him his great gratitude to Captain Allen Gardiner, his officers and men, for the assistance which they rendered him at Zanzibar.

Colonel RIGBY stated the River Juba had been hitherto entirely unexplored, and Baron von der Decken was the first European who had ascended any portion of it. All persons therefore interested in the exploration of the interior of Africa must deeply regret the sad termination of the enterprising expedition of this enthusiastic traveller. He did not think there was reason to fear that he had lost his life; the probability is that he is held captive, in the expectation of extorting a ransom. It appears that he left his steamer to proceed to the town of Berdera, which is inhabited by Somālis, and governed by a Somāli Sultan. He (Colonel Rigby) had had some experience of Somālis, and studied their language; they are a very warlike, independent race, strict Mohammedans, and although rude and barbarous, they have many good points. He did not think that Somālis would ever put to death any person who had fallen into their hands. There are several instances, some of which he would mention, of Europeans having been taken prisoners by Somālis, but he had never heard of their putting captives to death; on the contrary, they usually treat such captives kindly. The Somāli race is spread over a vast extent of country, including the whole of the great angle of the African continent, from Brava to the Gulf of Aden, and to Cape Guardafui. Higher up than Berdera the country is inhabited by Gallas, a savage race, who regard all strangers as enemies; had the Baron fallen into the power of these people there would be little hope of his life being spared. Berdera is the chief town of a considerable State that carries on much trade with Brava, which is also governed by Somāli chiefs, although nominally subject to the Sultan of Zanzibar. American merchants from Zanzibar sometimes reside for several months at Brava, where they procure hides, gums, ivory, &c., in exchange for manufactured goods. The Somālis at Brava have always been friendly to Europeans, and there is every probability of the Baron being rescued through the assistance of the Brava chiefs. Many years ago the boats of the British men-of-war *Leopard* and *Dædalus* were attacked near the mouth of the River Juba, and some of the crews captured. They were released on payment of some arms and ammunition as a ransom. The cause of the attack was that the Somālis, seeing the Europeans digging in the sand for water, imagined that they were digging up gold. Some years ago the boat of an American whaler had lost its ship whilst chasing a whale, made the land of Magadesho; some of the crew perished from exhaustion, the survivors were taken by the Somālis and taken to Magadesho, where they were sold. A merchant of Brava, hearing of this, went to Magadesho and ransomed them, and conveyed them to Brava, where they were kindly treated. There is also very strong circumstantial evidence that the survivors of the crew of the British ship *St. Abbs*, which was wrecked on the island of St. Juan de Nuovo, about 100 miles north of Madagascar, in the month of June, 1855, and which floated up to the coast of Africa near Magadesho, are still held in captivity by the Somāli tribes in the interior of this part, and he (Colonel Rigby) sincerely hoped that Her Majesty's Government might be induced to take measures to procure their release. It might be of interest here to refer to

such knowledge as we possessed relative to the River Juba previous to the expedition of the Baron von der Decken, and which may explain the object he had in view in forming an expedition at so great a cost and with so much resolution to explore this unknown river. In the year 1811, the British Political Resident at Muscat reported to the Government of India that he had obtained information from persons well acquainted with the east coast of Africa that a river of immense extent discharges itself into the Indian Ocean, near the equator, where it is called the "Govinda Khala;" that the length of its course is about three months' journey; that at nine weeks' journey from its mouth stands a large city, called "Gomana," up to which, the river being navigable, immense numbers of slaves, elephants' teeth, &c., are brought down to within a short distance of Brava, to which, the river then taking a more southerly direction, these articles of merchandise are carried overland. In consequence of this information, the Government of India sent a vessel of the Indian navy to search for and explore this river. The vessel, however, was swept to the south of the mouth of the river by the strong current, and anchored at Patta. There the Commander, Captain Smee, was informed by the Sultan that the River Juba or Govinda is of immense extent, that its sources were beyond his knowledge, and that they believed it flowed from the country of the white man. He added that a great many slaves were brought down the river to Brava. Sir W. Harris, during his mission to the southern kingdom of Abyssinia in 1842, also obtained information of a vast river, there called the "Gochol," flowing from west to east through the eastern portion of Africa, and taking its principal source in the highest mountain land north of the equator. Fifteen days' journey south from Enarea it is joined by the "Omo," a large tributary. Sir W. Harris adds that the Gochol is crossed by means of rafts formed of the trunks of large trees lashed together with strips of raw hide. There is no doubt that the Gochol of the upper country is the Juba. The next information we have of the Juba is from Lieutenant Christopher, commanding the Indian navy brig *Tigris*, who visited Brava in 1843, and who is the only European who has ever visited the large river which flows from north to south, inland from Magadesho and Brava, and which he named the "Haines River." He paid a visit to "Giridi," the capital of a powerful Somali chief; at that time the whole country was in arms to follow this chief to attack Berdera, the people of which had often provoked a crusade by their aggression and plundering propensities, under the pretence of reforming the customs of the people. He adds that the Arabs of the seaport towns favoured the Berdera chief, as he respected their shereefs and sayyids and adopted Arab customs. The Somalis are passionately fond of dancing, and the chief of Berdera, having adopted the Arab ideas of the exclusion of women, had determined to put a stop to the custom of both sexes dancing together, and within the previous five years at least 10,000 men had fallen in the battles to decide this question. Lieutenant Christopher remarks, that whilst the kingdoms of corresponding latitude on the west coast of this great continent are of that bloody despotic description which savage nations alone submit to, here the government is mild, although, with a moderate force of 10,000 spearmen into the field, and probably 50,000 if he flattered the more republican districts which nominally own his authority. Although the people of Giridi had never seen a white man before, they treated Lieutenant Christopher and his party everywhere with the greatest kindness and hospitality. Natives who had been in the habit of visiting the Juba at Gowana, assured him that at that point it is twice the width of the Haines River. From the period of the visit of the *Tigris* no British ship had visited the port of Magadesho until he (Colonel Rigby) went there in H.M.S. *Gorgon* in 1861. It is governed by a Somali sultan; the people were very friendly to us, and appointed an escort

of 200 armed men as a guard of honour to the officers when on shore. The Somālis of this part are the finest race of Africans he had ever seen; scarcely a man is under 6 feet in height, and they have most beautiful white teeth. Magadesho was formerly the capital of a powerful kingdom; it was for some time in the possession of the Portuguese, and there are four towers still standing, the remains of Christian churches. The climate of this part is very salubrious, and the natives attain to great age. Lieutenant Christopher says, "In this delightful region all of us felt an elasticity of spirits which will not soon be forgotten." The soil is very productive, the country people industrious. There is a considerable trade from Caravans also cross to Zeila and Berbera. At Zanzib was frequently talked to by Arabs and Somālis about stated that it flows from a large lake or inland sea, about three months' journey from its mouth. He had always considered that the exploration of this river was one of the most desirable points in African geography, because, if it should prove navigable for any distance, it will open a vast country in the interior to commerce; and should it be connected with any of the great lakes in the interior, water communication might be established, possibly, with the Victoria Nyanza. Had Baron von der Decken's expedition not come to such an unfortunate termination, the question as to the course of this great river would have been solved, and most important addition made to our knowledge of African geography.

Mr. JOHN CRAWFORD asked whether the fact of the Somālis being Mahomedans and the Gallas not, was a sufficient explanation of the superiority of the one race over the other in kindly feelings.

Colonel RIGBY did not consider that religion had anything to do with it. The Gallas are a warlike and vast nation in the interior, and their hand is against every stranger simply because they know strangers only as slave-hunters. The Arabs, the Abyssinians, and the Somālis all hunt them and take them into slavery. The Somālis being Mohammedans could not be made slaves, therefore they had not the same reason for distrusting strangers. The Gallas, moreover, could not distinguish between Arabs and Europeans; therefore, every white face they saw they took to be Arabs. They are an entirely different race from the Somālis. He knew very little of the Gallas, except from seeing the few individuals who are brought down as slaves. Sir William Harris and Dr. Krapft, who had been on the borders of their country, described them as living under a considerable degree of civilisation, that they had a settled government, and that some portions of their country are governed by queens, who live in considerable state; and that on the outlying districts the Arabs are always making war upon them to steal and sell them. The consequence is that they look upon strangers with enmity.

The PRESIDENT here informed the Meeting that our Consuls at Zanzibar were in possession of some very curious information respecting the fate of the passengers and crew of the *St. Abbs* East Indiaman, which was wrecked on the Somāli coast eleven years ago, and he hoped to hear something on that intensely interesting collateral subject.

Colonel PLAYFAIR said with regard to the shipwrecked passengers of the *St. Abbs*, he was reluctant to hold out hopes of their surviving to their relatives; but a singular circumstance had come before him in his consular capacity, which he would read to the Meeting in the form in which he had communicated it to the Government of Bombay at the time:—

"Zanzibar, 15th March, 1865.

"Sir,—A few days ago an Arab merchant, named Saeed bin Mobaruk, arrived from the Banadir or Somāli coast, north of the Zanzibar dominions, with a cargo of hides which he had purchased chiefly from the savage Somāli tribe named Abghal. On loading his boat he was surprised to notice that one of

them was marked with what he rightly conceived to be European letters. He kept it separate, and delivered it to Messrs. William Oswald and Sons, who sent it to me.

"The inscription, as nearly as I can copy it is, 'N E B N.' The first three letters are very distinctly, 'N, E, B,' the last looks like the first three strokes of an 'M,' which had afterwards been spoilt by the addition of a stroke above and below. I cannot form an idea of what these letters signify, but I think there is reason to infer from them that the reports which have so long been in circulation that some of the survivors of the *St. Abbs* are still in captivity amongst the Abghal, are not without foundation.

There is no room to doubt that this inscription really was on the hide when it came from the interior, as my informant assures me that he saw it, not, indeed, when he brought it, but before it was put on board his boat; furthermore, he says that he saw at least two other hides similarly marked, though, as they have got mixed up with the others, some of which he sold before reaching Zanzibar, he cannot tell what became of them.

"I have made known to him and to others that I would give a reward of 500 dollars for every one of our unfortunate countrymen who should be released through their instrumentality; and Saïd bin Mchamuk has promised to return as soon as possible to the place where he obtained the hide in question, and institute inquiries on the spot.

"I think it would be well not to give this subject publicity: the crew of the *St. Abbs* are given up for dead by their friends, and it would be cruel to excite hopes which might never be realised."

He thought that some of the survivors, finding it impossible to communicate with the coast by other means, had hit upon this expedient of writing something on a hide in hopes that it might be seen by some of their countrymen. Before leaving Zanzibar, he spoke to an influential native of Brava, who promised that he would use his best endeavours to trace these men.

Colonel RIEBY said the Abghal Somalis were the very tribe that he had always heard spoken of as being in possession of the interior. An Arab woman who had been in slavery to these people, he said, there were white men in captivity there. He felt confident there would be very little difficulty in ransoming them.

The PRESIDENT in conclusion, said he could not adjourn the Meeting without reminding them of the noble character of the enterprise which Baron von der Decken had undertaken. The point where his vessel was wrecked was only what might be called the beginning of the expedition. It was his intention to leave his steamer for twelvemonths on the Juba, and to explore the whole of that part of Eastern Africa between it and the eastern affluents of the Nile; and if he was prevented from returning by the same way he hoped to be able to reach the route of Captains Speke and Grant, and descend the Nile. Almost the last words Baron von der Decken said to him, on the eve of his departure, were, that if he did not come out in twelvemonths from the interior with stores of new geographical knowledge, he might be considered by his friends as having perished in the attempt.

Seventh Meeting, February 26th, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT,
in the Chair.

PRESENTATIONS.—*R. W. Jackson, Esq.; T. Valentine Robins, Esq.; Charles H. Gatty, Esq.*

ELECTIONS.—*The Marquis Giammartino Arconati; William Babington,*

Esq.; George Bateson, *Esq.*; Lieut.-Colonel John Chambers; W. R. Clayton, *Esq.*; Sir Robert Colquhoun, K.C.B. (H.M.'s late Political Agent and Consul-General, Egypt); Thomas D. Edwards, *Esq.*; Robert Ward Jackson, *Esq.*; John Lampray, *Esq.*; Capt. Herbert Midmay; G. Munnors, *Esq.*; Drummond Smith, *Esq.*; Baron Skribauneck (Captain in the Austrian Navy); Geo. Webster, *Esq.*; William Walker, *Esq.*; Sir Henry D. Wolff.

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, FEB. 12TH, 1866.—‘*Sur la Possibilité d’atteindre le Pôle Nord*,’ par M. Charles Martin. ‘Report on the Pearl-Oyster Beds in the Persian Gulf,’ by Lieut.-Colonel Pelly. ‘Coup-d’œil sur quelques points de l’Histoire générale des peuples Slaves, et leurs voisins les Turcs et les Finnois,’ par M. A. Viquesnel. ‘The Negro and Jamaica,’ by Commr. B. Pim, R.N., &c. ‘Observations on the People inhabiting Spain,’ by H. J. C. Beavan, *Esq.* All presented by their respective authors. ‘Tables of the Sun’s true bearing or Azimuth, from Sunrise to Sunset,’ by J. Burwood, Staff-Commr. R.N.; presented by the Admiralty. Continuations of Journals, Periodicals, &c. &c.

ACCESSIONS OF MAPS SINCE THE LAST MEETING.—A Meteorological Diagram, showing the daily elements throughout the year 1865, by C. O. Cator, M.A. A tracing of Paylon Harbour, in the state of Ecuador, South America. The World, showing the limits of the Vegetable Kingdom, by Professor Dr. A. Grisebach. Ordnance Maps, 133 sheets.

The PRESIDENT, in reference to the interesting account which was given at the last meeting of the Society by Colonel Rigby and Colonel Playfair concerning certain Englishmen who are held in captivity by the Somāli, announced that Colonel Rigby had drawn up a paper on the subject, which would be communicated at the next meeting of the Society, and he (the President) hoped the result would be to stimulate the Foreign Office to take some steps to procure the release of these unfortunate men, who are said to be still in the interior of the Somāli country.

The Paper of the evening was—

1. *An Exploration of the River Purús.* By W. CHANDLESS, *Esq.*, M.A.

MR. CHANDLESS, whilst travelling in South America, resolved to attempt, unaided, the exploration of the Purús—a river which had hitherto baffled all endeavours to trace its course, although results of the highest commercial and political importance were anticipated to follow should it prove a navigable stream. Native Brazilian traders from the Amazons had ascended the river for a long distance and found no obstructions to navigation; and it was naturally concluded that this stream supplied the great desideratum of an easy means of communication between the eastern parts of Peru (sepa-

rated from the Pacific ports by the almost impassable ridges of the Andes) and the Atlantic. In modern times there had been four expeditions up the Purús ordered by the Brazilian Government. One of these (in 1860) was conducted by Manoel Urbano, a mulatto of slight education, but of great natural intelligence. By great tact, firmness and courage he had acquired an extraordinary influence among the Indians, and was besides well acquainted with many tribes and their languages. The chief object of his expedition was to investigate the rumoured inosculation of a tributary of the Purús with the great river Madeira, above the rapids of the latter, which, if it had proved to exist, would have been of incalculable advantage to Brazilian commerce. Such a connection, however, was found not to exist. In 1862 a more important expedition was despatched, a steamer being sent up with a Government surveyor on board. Very little, however, was accomplished, the steamer returning after having penetrated 800 miles without finding less than $7\frac{1}{2}$ fathoms in the channel. No astronomical observations for fixing positions had been taken previous to Mr. Chandless's visit. He hired an open boat and a crew of Bolivian Indians at the town of Manaos, on the Rio Negro, and commenced his ascent on the 12th of June, 1864. He succeeded in reaching nearly to the sources of the main stream, and returned to the Amazons in February, 1865. Being provided with astronomical and surveying instruments he devoted himself to mapping accurately the river, and sent to the Geographical Society his tracings. The length of the river, from its mouth to the point which he reached, he found to be 1866 miles. It flows in a very tortuous course, unobstructed by rapids, through a rich alluvial plain, so thickly covered with lofty forest that he could nowhere obtain a view of the surrounding country. The chief result of his exploration was that the South Peruvian River (Madre de Dios) was not, as had been hoped, the head-water of the Purús, the river ending two degrees further north. The small tribes of Indians living near the sources had never been in communication even with the semi-civilized tribes lower down, and still used their primitive stone hatchets. They had dogs, but no fowls. Tapirs were extremely numerous in this remote solitude. They seemed rather astonished than alarmed at the sight of the travellers; and unless they made straight towards them, the animals seldom moved away. Capybaras were still more numerous and tame. Here for the first time the health of the little party began to give way, and half his men were disabled by ague. Near the sources two nearly equal streams form a confluence, and Mr. Chandless ascended both branches of

the fork, finding them obstructed by rocks and rapids. At the extreme point reached on the north fork the river had an average width of 40 yards. He was inclined to believe that the source itself of the Purús was then not less than 20 miles distant. The farthest point reached on the north fork was $10^{\circ} 36' 44''$ s. lat., $72^{\circ} 9'$ w. long.; on the south fork, $10^{\circ} 52' 52''$ s. lat., $72^{\circ} 17'$ w. long. Height above sea-level 1088 feet. The paper concluded by announcing that the author was resolved to complete his self-imposed task, and was preparing for another ascent of the river to ascertain whether the Aquiry, a southern affluent of the Purús, might not lead to the Madre de Dios.

This paper will be printed entire (with Mr. Chandless' map) in the Journal, vol. xxxvi.

The PRESIDENT said, Mr. Chandless was an English gentleman who at his own expense and risk had accomplished what the Kings of Spain and the Indies and the South American colonists had been unable to do. He had ascended this long and most interesting river for nearly 1900 miles above its junction with the Amazons. Without alluding to the scientific details communicated in his valuable paper, they would say it was an exploit worthy of the approbation of the Geographical Society. Up to this moment the Amazons itself is a river not half known to us. Recently P. A. A. had passed up the lower portions of it, and he had already acquired a great amount of knowledge respecting its natural productions, more especially its ethnology. A young Englishman, Mr. Edward Bartlett, was now engaged in the productions in the portions of its course a thousand miles above the mouth of the river, as investigated by M. Agassiz. With regard to the Purús, one of the principal tributaries of the Amazons, it was a matter for the future to see whether it would serve, as some persons had supposed, as a means of communication between the Atlantic and the countries of the Andes. It might be that railroads would eventually be established in the eastern provinces of Peru, connecting them with this great river. Only a few days ago he received a letter from a good geographer and geologist, Mr. Wilson, resident at Quito, in Ecuador, who had communicated to him an excellent paper on the geology of that region, stating that the Government of that Republic was endeavouring to construct a railroad from Quito to some one of the navigable northern affluents of the Amazons, so as to bring down the productions of the Ecuador to this great river. All the countries on the north, south, and west are thus trying to put themselves into connection with the river Amazons, and thus obtain a more rapid and more easy communication with Europe, than they can now obtain by sending their products across the Andes to ports on the Pacific. If Sir W. Smith, Bart., who had opened out this vast subject long ago to British geographers, had been present he would have pointed out the vast importance of further explorations of this region. He had, however, communicated by letter his entire approbation of the admirable researches of Mr. Chandless. With regard to the Amazons, three-fourths of that great river is yet unexplored by the Brazilians. The Emperor of Brazil, an Honorary Fellow of the Society, has shown the greatest interest in these expeditions, and he had no doubt that he would give every assistance to future explorations, as he had done to the expedition of M. Agassiz. They had also the aid of a nobleman, Baron de Mauá, who was the first to establish steam navigation on the Amazons, and who would kindly explain the intense interest which the Brazilians take in these explorations. But

before calling upon that gentleman he would ask Mr. Bates, who has spent so many years on the Amazons, to speak in relation to this most important communication.

Mr. BATES said he was never himself actually on the Purús. He had passed by the mouth of the river four different times, but he had spent about four years in the centre of that great area of country to which the Purús belongs—he meant the plains of the Upper Amazons. He was struck with admiration at the perseverance of Mr. Chandless and his powers of minute observation, knowing the great difficulties he must have had to contend with in ascending these little-known rivers, especially the difficulty of procuring a crew of Indians and keeping them together after they were obtained. The mouth of the Purús lies 1100 miles distant from the mouth of the Amazons. Mr. Chandless had examined it for 1900 miles, and had found it navigable by large vessels about half that distance and by smaller vessels for nearly the whole distance. The result of his expedition, however, was rather to destroy the hopes that had been raised of the great commercial value of this river. The River Purús had been for more than a century a subject of the highest interest to the Peruvians, the Bolivians, and the Brazilians. Several papers upon it had also been published in the Journal of this Society. It had always been believed that a river (the Madre de Dios) which flows down the eastern slopes of the Andes, in the southern provinces of Peru, was the head-water of the Purús. This was also the opinion of our English traveller, Mr. Wood, one of the few Europeans who had trodden the banks of the Madre de Dios. The result of Mr. Chandless's exploration is to show that this South Peruvian river has probably nothing to do with the Purús, the latter ending some distance to the north of it, in the same great central wilderness through which it flows throughout its whole course. Though deep and navigable for almost its whole length, the Purús is so exceedingly tortuous that even if it had led into the peopled countries of Southern Peru it would scarcely have been a valuable channel of communication with Europe. But, whatever might be said of the Purús, no objection of this kind could apply to the main stream of the Amazons, which he had himself investigated for 1800 miles of its course, and the resources of which were only now beginning to be developed. The Amazons is remarkably straight as a river; it is at all seasons of great depth, and is navigable for large vessels right up to the slopes of the Andes, not in the southern but in the northern provinces of Peru. The Peruvian Government have placed a line of steamers of 500 tons burthen on the upper part of the river lying within Peruvian territory, to ply in connection with the Brazilian lines which run between the Brazilian frontier and the Atlantic. The Peruvian steamers now sail monthly to Yurimaguas, on the Huallaga, a place 3100 miles distant from the Amazons. In the height of the dry season, for a month or so, they could scarcely reach so far as Yurimaguas, on account of the shallows, and then they stop at a place called Laguna, 100 miles lower down; but this place, which is 3000 miles from the Atlantic, is accessible for large vessels at all seasons of the year.

Baron de Mauá felt deeply grateful as a Brazilian, who took great interest in the prosperity and welfare of his country, for the services which Mr. Chandless had rendered to science and for the light which he had thrown on the navigation of this important tributary of the Amazons. That the Amazons might be soon thrown open to the commerce of the world was shown by this fact. Fifteen years ago the Government of Brazil granted him, for the Steamboat Company which he had formed, the exclusive right of navigating the river for a period of thirty years. That was just fifteen years ago. Years afterwards, on hearing that the Government had some intention of proposing the freedom of the navigation of the river, he came forward at once and

expressed his willingness to give up, for the remainder of his term, the exclusive privilege which had been granted to him. In 1864, before he left for Europe, he had had the satisfaction of voting in the Chamber of Deputies for a Bill throwing the navigation of the Amazons and its tributaries open to all the world. Unfortunately the vote of the Chamber took place late in the session, and when the Bill went up to the senate it could not be converted into law in that year. During 1865 the Chamber only met a few days, just to provide the Executive Government of Brazil with the means of carrying on the war with the despotic ruler of Paraguay; consequently the law did not pass in that year. But he fully hoped that during the present year the law would pass the senate, and that the river would then be thrown open to the commerce of the world.

Mr. GERSTENBERG said the paper was a welcome addition to our but scanty knowledge of the affluents of the Amazons, of which there are about sixty of the size of the Danube. The President and Mr. Bates had dilated on the importance of this exploration of the Purús as elucidating the question of communication between the Pacific and the Atlantic; but the Madre de Dios, which was supposed to be the actual source of the Purús, did not appear to be connected with this navigable river. Referring to a similar question a little further north, in Ecuador, the Esmeraldas, a river which flows down from Quito to the Pacific is not very navigable, there being a bar at the mouth. Señor Victor Proaño, who was appointed by the Government of Ecuador some time ago to examine the Yaquachi, a river lower down than the Esmeraldas, discovered a depression in the Andes near the point where that river flows towards the Pacific, and the Morona towards the Amazons. These he believed were really the two rivers which would marry the Pacific to the Atlantic across Equatorial America. Baron de Mauá had stated that the navigation of the Amazons would be thrown open. He would remind the Society that a paper on the subject was read two years ago, when he made some remarks on the question whether, according to international law, the Brazilian Government could shut up that great river, which was 180 miles wide at its mouth, and which carried its current 200 miles into the ocean. He believed the opinions expressed on that occasion had exercised an influence on public opinion in Brazil in relation to this question. Baron de Mauá, the originator and chairman of the Steam Navigation Company of the Amazons, which employs eight steamers, had contributed more than any geographer towards a practical knowledge of that gigantic river. He was the Baring and the Peabody of Brazil, and great credit was due to him for offering to give up his exclusive monopoly of the navigation for thirty years. Mr. Gerstenberg complained that South America did not receive the consideration at the hands of the Geographical Society which Africa and Australia did, and yet nothing could be more important than to settle by geographical question of frontiers between the different countries of South America. Owing to the want of precise information, had led to constant disputes between Brazil, Peru, and Ecuador.

After a few observations from the PRESIDENT on the necessity of the discussions being kept entirely free from all political considerations, whenever memoirs bearing upon international frontiers were read, the Meeting was adjourned to the 12th of March.

Eighth Meeting, March 12th, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in
the Chair.

PRESENTATION.—*Thomas Dyer Edwardes, Esq.*

ELECTIONS.—*John E. Flood, Esq.; Lt.-Colonel James E. Gastrell* (Beng. Staff Corps); *R. Richard Glover, Esq.; Joseph Hooker, Esq.,* M.D., F.R.S., &c. (Director of the Royal Gardens, Kew); *Major Henry C. Johnson* (Beng. Staff Corps); *Arthur Scott, Esq.; Colonel Richard Strachey, R.E., F.R.S.; Alexander Walker, Esq.; W. A. White, Esq.* (H.M. Consul at Dantzic); *John Young, Esq., F.S.A.*

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, FEB. 26TH, 1866.—‘Alexander von Humboldt; or, What may be Accomplished in a Lifetime,’ by F. A. Schwartzenberg. Presented by Sir R. I. Murchison, Bart., K.C.B. ‘Denkmal auf das Grab der beyden letzten Grafen von Purgstall,’ von J. von Hammer. ‘Geschichte der Erdkunde,’ von Herr Oscar Peschel. ‘Geschichte des Zeitalters der Entdeckungen,’ von Herr Oscar Peschel. Both presented by the Author. ‘The Celebrated Theory of Parallels,’ by Mathew Ryan, Esq. ‘Madagascar and the Malagasy,’ by Lieut. S. P. Oliver, R.A., F.R.G.S. All presented by the Authors. ‘Catalogue of the London Library,’ by R. Harrison, Esq. Presented by the Library. ‘Geografia Universal,’ 4 vols., por D. Mariano Torrente. Presented by John Power, Esq., F.R.G.S. ‘Le Tour du Monde,’ and continuations of Journals, Periodicals, &c. &c.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING.—Five sheets of the Geological Map of Sweden, by Professor A. Erdmann of Stockholm; scale 1 inch = $\frac{1}{4}$ mile. River Niger, a manuscript Map by Dr. Baikie, showing the Settlement of Lukoja; presented by T. Valentine Robins, Esq., F.R.G.S. Australia—River Adelaide. Showing the explorations of the Government Surveyors, Messrs. Auld and Litchfield; scale 1 inch = 2 miles; presented by F. S. Dutton, Esq., F.R.G.S.

The first subject brought before the Meeting was the death of Baron C. von der Decken, news of whose murder by the people of Berdora, on the Juba, had been received from Zanzibar during the week.

The PRESIDENT announced the lamentable intelligence in the following words:—“At our last meeting we entertained hopes for believing, on the authority of those who were best acquainted with the Somali people, that the lives of Baron C. von der Decken and Dr. Link might be saved. Alas! these

hopes have vanished, and the two bold explorers have been put to death at Berdera, in the manner which will presently be explained to us by Colonel Playfair, Her Majesty's Consul at Zanzibar. This deplorable event has overwhelmed me with grief for the loss of a man whom I was proud to call my friend, and to whom the great services he had already performed, was destined, I am sure, to throw great additional light on the geography of that wholly untrodden country which lies far to the south of Abyssinia. At our next anniversary meeting it will be my endeavour to do justice to the memory of the noble spirit which has fled, and in the mean time I request Colonel Playfair to state the main facts connected with this sad catastrophe."

1. *An Account of the Death of Baron C. von der Decken and Dr. Link.*

By Colonel PLAYFAIR, H. M. Consul and Political Agent at Zanzibar.

AT our meeting last month we discussed the disastrous termination of Baron von der Decken's expedition up the Jubá River, and speculated on the probability of his being still alive, even if a captive. I stated that in my opinion there was a *chance* that he might still be safe, though I fear that the wish was father to the thought, and that in my heart I had but little hope. Since then I have received a series of letters, dated from before the Baron entered the Juba, up to last month; one is from the Hanseatic Consul, another from Bishop Tozer, and two from the Baron himself, written in very low spirits. He detailed all the difficulties and dangers he had encountered up to his arrival at the Juba, and concluded with the melancholy expression—"Good bye; I will not say *au revoir*, for I fear there is little chance of that." He evidently did not feel very confident of success, but probably little thought that the expedition would have ended so abruptly and fatally as it has done.

I will not recapitulate what we have already heard from the Baron's own journal, and the Ritter von Schiekh's Report.* I will only remind you that the smaller steamer was lost on the bar of the Juba, and that on the 26th of September the other steamer, the *Welf*, struck on a rock near some rapids above Berdera, about 350 miles up the river, and the party proceeded to repair the damage.

On the 28th the Baron, in company with Dr. Link, a Brava chief named Abdio, and about six native attendants, left the camp, in order to revisit Berdera; their object was to procure provisions, and to obtain information as to the route they should take after abandoning the steamer, which they believed could not again be made available.

On the 1st of October, the Baron and his party being still absent,

* *Vide ante*, Meeting 12th February, p. 91 *et seqq.*

a sudden attack was made on the camp, the result of which was that Trenn the artist, and an engineer named Kanter, were killed. The others were able to repulse the enemy, who (and it is important to bear this in mind) left several of their number dead on the field.

Finding their position very precarious, and getting no tidings of the Baron, the remaining members of the expedition left in a boat, pulled down to the mouth of the Juba, where they abandoned their boat, and walked along the shore till they met a native vessel, which brought them to Zanzibar. The party which escaped consisted of the Ritter von Schickh, four other Europeans, and eight negroes.

But to return to the Baron. Immediately on his arrival at Berdera he commenced to make arrangements regarding the purchase of provisions. While he was so employed, the Berdera people, knowing that the party at the steamer was much weakened, attacked it as before mentioned. The Baron soon got news of their intentions and resolved immediately to return to the camp. But he found his boat gone; Abdio, the Brava chief, refused to act as guide and no one else could be got to show him the road. He however started in company with Dr. Link and the Zanzibar negroes, leaving his property behind in charge of Abdio.

They lost their way and spent the night of Saturday, the 30th September, and Sunday, the 1st of October, in the open country. Upon this the Baron and Dr. Link consulted as to what they should do, when it was determined that the latter and one boy should still endeavour to find the camp, while the Baron with three attendants returned to Berdera. On his arrival there, the Baron appears to have given out that he had been to the steamer, and had found all safe on board; but his hearers must have known well that it was not so. The Baron resumed his negotiation for provisions, and purchased and sent off to the camp several bullocks, which, as might be expected, never reached their destination.

Abdio promised to get more provisions on the following day (Monday, the 2nd October), and on that day the Baron was summoned to have a consultation about them. He left his servants in charge of his property; and on his return he found that these, together with all the arms were gone. The servants subsequently explained that they had been called away by Abdio, and as soon as they had left the hut the muskets were removed.

On the Baron's return from the conference he demanded his muskets, but received no satisfactory reply. Shortly afterwards Abdio came in with the report that the missing boat had been found, and begged the Baron to send his men to take charge of it. As

soon as these got out of the Baron's sight, they were seized by the Berdera people and imprisoned in a mosque. In the mean time others of the Berdera people brought back the Baron's guns and laid them at his feet. He was then sitting on a native bedstead, and as he stooped to pick them up, several Somālis rushed on him, seized his arms and bound them behind his back. Abdio was not present while this was being done. In vain did the Baron beseech them to release him, promising them any sum of money they might demand; in vain did he even beg that Abdio might be sent for; his captors were deaf to his entreaties; they carried him immediately to the river, where they put him to death. Four of the Zanzibar negroes saw him taken away, but they were afraid to interfere; afterwards they saw his garments saturated with blood. His body was thrown into the Juba River.

We must now follow Dr. Link. On parting with the Baron he was attacked by a party of Somālis, but he saved himself for the time, partly by running, and partly by swimming. The boy who accompanied him swam to the steamer; and the dismay of both can better be imagined than described, at finding it abandoned by their comrades.

The Doctor found his way back to Berdera, where he arrived the day after the Baron's death. He also shared his leader's fate, and his body was thrown into the river.

The natives belonging to the expedition were detained some time in captivity; but they were subsequently released, in consequence of their being Mahomedans, and Haji Ali, the Chief of Berdera, permitted them to go to Brava. The Baron's property was divided amongst the Somālis, and the treacherous guide Abdio shared in the plunder.

There is no reason to believe that any of the other natives belonging to the expedition acted treacherously. It is probable that they deserted their master on the first appearance of danger, but this was to be expected: indeed, they could not have afforded him any material aid, the whole population of the country being against him.

We need not be at a loss to understand the motives which induced the Somālis to commit this atrocity. The valuable plunder to be obtained by the sack of the steamer would have been more than a sufficient inducement; but, doubtless, other motives also actuated them. They could not understand what object the white man had in penetrating their country, and they were naturally alarmed and suspicious. The Chief of Berdera was probably vexed at the manner in which his overtures towards reconciliation had been

received by the Baron, as stated in the Baron's own Diary, and, to crown all, they desired to avenge the death of their clansman who fell in the attack on the camp.

Had the departure of the Ritter von Schickh with the remainder of the expedition been less precipitate, it is possible that the Doctor might have been saved: on the other hand, it is by no means improbable that these also might have been betrayed, and might have shared the Baron's fate. I do not see what can be done to avenge this atrocity: the perpetrators of it are equally beyond Seyed Mejid's reach and ours; H. H. the Sultan cannot be held responsible for what has occurred. The Baron went on this journey in opposition to his earnest remonstrance, and His Highness begged me to communicate to the Baron, that while he would give him all the aid in his power, he had no authority in that country beyond the sea-coast, and he declined to be held responsible for any disaster that might occur. This condition was explained to the Baron, who recognised the justice of it.

His Highness has now done all that lies in his power: he sent one of his secretaries in H.M.S. *Vigilant*, to act as interpreter, and supplied the officer in command with letters to all the chiefs on the coast. Captain Latham visited Brava, but he could do nothing more than obtain confirmation of the Baron's fate. H. H. has also promised to do all in his power to secure the Baron's journals, and to bring to justice the villain Abdio, who appears to have sold and betrayed him. The only thing I have yet heard in favour of Abdio—and this ought to be recorded as well as the charges against him—is that he warned the Baron against going back to Berdera, saying, that after the quarrel he had had with one of the chiefs, he would certainly be killed immediately on his return. This is probably all we shall ever know of this ill-fated expedition; perhaps the most promising and best equipped that ever attempted the exploration of Africa, and certainly the most disastrous in its untimely end.

The PRESIDENT asked Colonel Playfair whether he did not think it possible that the Sultan of Berdera had really nothing to do with the assassination of the Baron; and whether it might not have been done by a tumultuous mob of people, who had heard of their fellow countrymen at a distant part of the river being killed?

Colonel PLAYFAIR replied that it was very likely that the first attack on the camp was made by a tumultuous mob of Somalis; but he did not think that the Baron would have been assassinated without the Sultan's orders. The Sultan of Berdera was equally beyond the reach of the Sultan of Zanzibar and of the British Government. An expedition could hardly go up this unknown river a distance of 380 miles in sufficient strength to overawe the population of the country; but were it even possible for gunboats to ascend they could effect nothing, the inhabitants would simply retire till all danger

was past; and the town of Berdera is probably only a collection of mat huts, the destruction of which would give the inhabitants no concern.

The PRESIDENT said that as this was the last occasion for some time on which they would have to discuss the river Juba, he might state that there was present in the room a Mr. Angelo, an Englishman, who a number of years ago ascended the river Juba. The fact of that ascent of the river was so perfectly unknown to him (the President) and his associates in geography, that they had said that the recent exploration was the first occasion on which the Juba was ascended by Europeans. A general Gazetteer, prepared by a member of the Royal Geographical Society, to which he (the President) had referred, mentioned the river Juba as having been ascended by Mr. Angelo, but the year was not stated. Mr. Angelo would communicate to the Meeting his recollections of the river.

Mr. ANGELO read passages from his journal features of the river Juba and the country lying on its banks. was made in the year 1836. He stated that at that time Berdera was occupied by runaway slaves and the lower class of Somālis. His impression was that Baron von der Decken's murder must have been committed by the lower class of Somālis. He (Mr. Angelo) had always received the greatest hospitality from the Somālis of Berdera and the other towns on the Juba.


The PRESIDENT said that it would occupy too much of the time of the meeting to hear the whole of Mr. Angelo's journal read; but the Society would be very happy to profit from it by inserting it, with Mr. Angelo's permission, in a future number of their printed Proceedings.

2. *Englishmen in Captivity in Eastern Africa.* By COLONEL RIGBY.

At the last Meeting but one of the Royal Geographical Society it was stated that there is strong circumstantial evidence to show that several Englishmen have been for several years past kept in captivity by the Somāli tribes near Magdesho, on the East Coast of Africa. The circumstances connected with this subject are as follows:—

In the month of June, 1855, the British ship *St. Abbs*, from London to Bombay, struck upon the island of San Juan de Nuova. All the boats except one were swamped in launching. The remaining boat was taken by the captain, who deserted the ship with two of the crew, one a Belgian. They landed on the island, and made no attempt to render any assistance to those remaining on board. Two of the passengers, Mr. Ross and Mr. Bell, cadets in the Bombay army, jumped overboard to endeavour to swim ashore. Mr. Bell was drowned, Mr. Ross reached the shore in safety. The carpenter lowered his tools into the water in an empty cask, which reached the shore. He then swam ashore with one of the crew. The ship remained on the reef for some days, dismasted. At length, at daylight on the morning of the 14th of June, the ship had disappeared, and the persons on the reef naturally supposed that she had gone to pieces during the night. However, no bodies or por-

tions of wreck were washed up on the island; but brandy, champagne, and cases of preserved provisions were washed up, and proved very acceptable to the six survivors of the ship who were on this uninhabited island. It may be here remarked, that during the month of June the current sets with immense force to the north-west round the north end of Madagascar, and that the night the ship disappeared was the highest flood-tide during the month.

It afterwards became known that the hull of the *St. Abbs* had not gone to pieces on the island of Juan de Nuova as was supposed, but had been swept up by the current to the coast of Africa near Magdesho, where she was boarded by the natives, who possessed themselves of everything on board. A great many articles known to have been on board the *St. Abbs* were afterwards brought to Zanzibar and disposed of by natives of Magdesho. The *St. Abbs* was taking out Government stores, and amongst the articles brought for sale were Light Infantry bugles, cases of surgical instruments &c., all containing the Government mark thus ; also boxes of books, ivory billiard-balls (the *St. Abbs* was taking out several billiard-tables), surveying-instruments, officers' epaulettes, &c. As the wreck occurred at the season when vessels all go north from the East Coast of Africa, most of the articles recovered were conveyed to the Red Sea and Persian Gulf to be disposed of, and only those articles for which there was no sale in native markets were brought to Zanzibar to be disposed of amongst the European residents.

At the time the hull of the *St. Abbs* disappeared, twenty-six persons remained on board; viz., twenty-two officers and crew of the ship and four young gentlemen passengers. Nothing was heard of these until about four years had elapsed, when reports reached Ceylon and the Mauritius that a number of Englishmen were in captivity somewhere on the East Coast of Africa. The Governor of the Mauritius caused proclamations to be published in French and English offering a reward of five hundred dollars for every white man rescued, and forwarded copies with a letter to the British Consul at Zanzibar. From inquiries made by Colonel Rigby at Zanzibar, he found that there were very strong grounds for believing that the reports made to the Government of Mauritius were well founded, and that when the hull of the *St. Abbs* washed ashore near Magdesho the persons on board were captured by the Abghal Somalis, and carried into the interior.

Colonel Rigby at that time could not understand how the reports of Europeans being in captivity had reached Ceylon and Mauritius, when nothing on the subject was previously known at Zanzibar. But this was afterwards explained in a somewhat remarkable

manner. On questioning a very intelligent Somali inhabitant of Magdesho as to whether he knew anything of any white men being in captivity, he replied, "Yes, and I'll tell you how the information reached the Government, viz., as follows:—Some time after the Englishmen were captured, a caravan of pilgrims to Mecca went overland from Magdesho to Zeyla, and passed a place where they saw several white men in captivity. On arriving at Jeddah they found that the English Consul and all the Christians had been murdered, and they were consequently unable to report the circumstances, but they mentioned them to pilgrims from Ceylon and Mauritius, in the hope that through them information would be conveyed to the British Government. From information obtained by Colonel Rigby at Zanzibar, there appears no doubt that the survivors of the *St. Abbs* were divided into two parties; one of which was taken a long distance into the interior, and the other, consisting of three persons, is kept by the Abghal tribe of Somalis not far from Magdesho. Attention has recently been called to this subject from the circumstance that a bullock's hide brought from Magdesho to Zanzibar, which had been purchased from a caravan of Somalis just arrived from the interior, was found to have several English letters carved on it. The man who had purchased the hide put it aside and on his arrival at Zanzibar took it to Messrs. Oswald and Sons, who gave it to Colonel Playfair, the British Consul; he further stated that he had seen other hides with letters cut on them. Now these letters were, no doubt, carved by one of the captives, perhaps in the faint hope of their meeting the eye of some European.

The part of Africa inhabited by these Somali tribes is very salubrious and very fertile. The natives possess large herds of cattle, and the skins are brought for sale to Zanzibar.

There is communication with this part from Zeyla and Berbera in the Gulf of Aden. The Ogahden caravan to the great annual fair at Berbera traverses a great part of this country to the banks of the great river, called the "Wabbe Shabeli," which flows near Magdesho and Brava. The Resident at Aden might induce some of the Ogahden (or Woghadeen) tribe of Somalis to rescue these captives, or at least to bring information as to where they are residing. Inquiries should also be made at Brava and Magdesho on the East Coast.

A very respectable native of Magdesho, named "Hajee Noor," informed Colonel Rigby that he had been on board the vessel which came ashore at Magdesho, and, in confirmation of this, showed him some English iron saucepans which he said he had taken from it.

On being told of the reward offered for any of the captives recovered, he started by land to go to Magadesho (without receiving anything in advance, being told that his reward depended entirely on his success) to rescue them. On arriving at Lamoo, the Governor finding on him the proclamations, seized and imprisoned him, and, owing to the difficulty of communication at that season, he was seven months in confinement before information reached the Consul at Zanzibar. But it is not at all likely that Hajee Noor would have undertaken this long and perilous journey entirely at his own cost, had he not good reason for believing that he would be successful in rescuing the captives, and thus earning the promised reward.

Colonel RIGNY, after reading his Paper, added that he had that day seen for the first time the owner of the *St. Abbs*, and had received information from him which gave a strong confirmation to the reports stated in the Paper. Amongst the things brought to Zanzibar, as taken from the wreck of an English ship, were several Masonic ornaments—an apron, diploma, &c., some billiard-balls, astronomical instruments, surgical instruments, and books. The statement of the owner of the *St. Abbs* showed that these articles corresponded to articles known to have been on board that vessel. These circumstances showed the probability that either the hull of the vessel was washed ashore entire, or that part of the vessel did so, and therefore that the twenty-two Englishmen who were missing reached the coast of Africa alive. They had probably been in a state of captivity in that country for the last ten years. The object of alluding to this matter was the hope of inducing some measures for the rescue of these unfortunate persons, if they were still in existence.

The PRESIDENT said it would be a very easy thing to ascertain, by offering rewards, whether any of these fine young men, thus unhappily lost to their friends and countrymen, could be recovered. The parents of many of them were still living in expectation of seeing their sons again, and he sincerely hoped that Her Majesty's Government would take some active steps in the matter; there surely never could be a more worthy occasion than this for asking assistance from them.

3. *Notes on the Niger.* By T. VALENTINE ROBINS, F.R.G.S.

MR. ROBINS resided at the settlement of Lukoja, on the Niger, from September, 1864, to October 1865, having been left there by Lieut. Knowles, commander of H.M.S.S. *Investigator*, to assist Lieut. Bourcier, the successor of Dr. Baikie,* founder of the settlement. The *Investigator* entered the mouth of the river, August 30th. For many miles the Niger is described as very picturesque, subdivided into innumerable creeks, and varied with islands covered with a magnificent tropical vegetation, growing apparently out of the water.

* See 'Proceedings,' vol. ix. p. 74.

After passing Onitsha, a distant range of mountains came into view, and boulders and reefs began to occur in the bed of the river. Lukoja is situated on a verdant plain at the foot of Mount Patte ("Patte" being the native name for "mountain"), and opposite the mouth of the Tsadda. The settlement is founded on a tract of land ceded to the English Government by Masāba, king of Bida. King Masāba was described by Mr. Robins as a noble specimen of his race, with powerful frame, and bold and open expression of countenance. The Niger commenced to fall at the beginning of October, and by April 14th had receded 32 feet; still continuing to fall until the end of May. On the 1st of June it began to rise, and by September 10th had risen 41 feet 6 inches. It still continued to rise until the 28th of September, when it reached the height of nearly 50 feet, but this last rise was unusual. The river occupied 243 days in falling, and 122 in rising; there are therefore eight months of dry, and four months of wet weather. The table-topped hill behind Lukoja is 1100 feet high, and to the rear of it is a long extent of uninhabited forest country, which for three days' march is considered to be English territory, according to the treaty with King Masāba. A small river, the Adokodo, flows through this tract of land, and enters the Niger a little south of Lukoja.

Mr. Robins exhibited to the meeting a large number of drawings in oil and water-colours, illustrative of the scenery, natives, and vegetable productions of the neighbourhood of Lukoja.

The President said he believed that most geographers were acquainted with the merits of Dr. Baikie; and he was happy to say that the British Government had all along been alive to those merits, and had supported his settlement of Lukoja up to the present time. There was now, however, a doubt whether the Government would continue to support the establishment he had founded, and which had been described by Mr. Robins. He would read a letter on that subject addressed to the Assistant Secretary by Commodore Eardley Wheeler, the distinguished naval officer who had so long commanded on the West Coast of Africa and who had taken great interest in the expeditions up the Niger.

"MY DEAR MR. BATES,

"What the late lamented Dr. Baikie was unable to state before he died will, I trust, be stated before the Society by this gentleman (Mr. Robins) in a familiar manner.

"In consequence of my position as Commodore on the West Coast of Africa, I was mainly instrumental in sending up the last *three* expeditions, viz., 1863, 1864, and 1865; and, as you may well imagine, deeply interested in the success attending them. It would be a thousand pities, and materially detract from the high position which England now holds amongst the powerful chiefs that own the country bordering on both sides the river, were the Government to give up all future intercourse with these chiefs, and allow mercantile companies to brave the difficulties as they best can. An opening has been made, which, if resolutely persevered in, cannot fail to establish the

most friendly relations between us, and develop the resources of this rich and important part of Western Africa. If the natives find that the Government continue to show an interest in their advancement, and in the opening out of a mutually profitable trade, I am quite certain the chiefs will meet us more than half-way, and believe that we are really in earnest as regards the future prosperity of their country. But if, on the contrary, we desert them now, at this season of success, the consequence will be—what every one must foresee—a want of confidence will be engendered; no belief will be given to our assertions; we shall be laughed at and derided; no encouragement given to our missionaries or merchants; possibly expulsion from the country, with robbery and violence. Nor can we be surprised should this sad state of things occur. But if we keep our word, and do not break faith with them, the happiest results may be anticipated. Cotton in abundance will be planted; coffee, the sugar-cane, indigo, &c., will yield its increase; while ivory, gum, palm oil, &c., will find their way to our markets in large quantities. There must be a *certainly* of ; the natives can neither afford to plant, nor will they be disposed to look upon us as otherwise than a mere body of adventurers come to make all they can and then decamp.

“A small steamer, with a naval officer duly authorised, will do more good in establishing confidence and in preserving order than all the trading-vessels of Europe.

“Very faithfully yours,

“A. F. EARDLEY WILMOT.”

Mr. LAWSON (a gentleman of colour) said he had heard with pain of the brutalities which had been committed by some of his fellow countrymen. He had, however, always maintained and, he believed, should always adhere to the opinion that any European traveller might travel from the Cape of Good Hope to the Mediterranean, and from the Atlantic Ocean to the Red Sea, without being molested, provided he paid proper reverence to the religion of the country, and dealt with leniency and kindness towards the natives. As soon as the natives saw that the Europeans were not trying to take advantage of them they would join with them hand and heart.

4. *Papers relating to the recent Volcanic Eruptions in Santorin.*

(Communicated to Sir R. I. MURCHISON, by LORD CLARENDON and the Hon. Mr. ERSKINE, H.M. Minister at Athens.)

THE principal documents received by the Society relating to the recent volcanic eruptions are a series of letters from Dr. Schmidt, Director of the Royal Observatory at Athens, who had been despatched with three colleagues, on board the screw-steamer *Aphroessa*, to the island of Santorin, with a view to observe the phenomena. He states that the first trace of the revival of volcanic action in the crater-harbour of Santorin was perceived on the 26th of January. It occurred on the islet Nea Kameni, and consisted in the slow subsidence beneath the sea of the little settlement called Vulkano, situated on the south-eastern shore of the island. Nearly at the same time a new volcano began to rise on the island of Nea Kameni, a little to the south-west of Vulkano,

and at the southern foot of the old volcano. On the 13th of February, the new peak, consisting of great masses of lava and trachyte, had reached the height of about 55 mètres. Dense columns of vapour issued from it: not, however, from the summit, but from around the base, and the hissing and roaring of the steam-jets resembled the noises produced by a steam-engine. The sulphurous exhalations were not at first very powerful. The first great detonation took place about 10 o'clock in the evening of Feb. 12th, and was succeeded by a magnificent eruption of red-hot cinders. The columns of smoke and vapour were so dense on the 13th, that it was not possible to see what was going forward from the summit of Nea Kameni, at an altitude of 350 feet. Numerous fissures opened in the old crater during the course of these movements. About 11 o'clock on Feb. 13th, whilst the new volcano was in the height of its activity, ejecting aqueous vapour with fearful roaring and hissing, Dr. Schmidt beheld, from the summit of Nea Kameni, a rock arise from the sea in the direction of Palaia Kameni, and in the midst of a whirlpool which had formed in the spot for a short time previous; it subsided again after the lapse of four minutes, and the sea appeared to boil around its margin. On the 14th a new island appeared near the same place. The phenomena so far appeared to Dr. Schmidt not to have the normal character which he had observed at Mount Vesuvius in 1855.

On the 16th of February, Dr. Schmidt reported that the volcanic forces had increased in intensity. The new volcano had become larger, and had covered about fifty houses of the little settlement. During the previous two days the new island between Nea and Palaia Kameni had grown larger, and a lofty column of white vapour continued to arise out of the boiling sea. On the 20th, before 10 A.M., occurred the first considerable and dangerous explosion of the new volcano. Dr. Schmidt happened, with his colleagues, to be on the summit of Nea Kameni when a fearful thundering eruption of stones and ashes began, which lasted from two to three minutes. Leaving their instruments behind them they fled to the N.W., seeking as far as they could to shelter themselves from the shower of red-hot stones. They were all more or less hurt and burnt. The steamer *Aphroessa* was struck heavily by a shower of stones; the deck was stove in, only one yard from the powder-magazine, and the engineer's cabin was set on fire. At the mole lay a vessel, which was instantly set on fire by the stones and her captain killed on the spot by a falling block. Many of the sailors of the *Aphroessa* were hurt; but only one, a petty officer, seriously wounded. After the explosion the steamer changed her anchorage,

and landed her powder for fear of further accidents. Two eruptions of cinders, on the grandest scale, occurred on the 21st. On the 22nd, the general features of the phenomenon were the increase of vapours, and the formation of upwards of one hundred water-spouts, which seemed to indicate the imminence of some more considerable event. Towards 3 o'clock a gigantic eruption of cinders and stones took place, accompanied by a noise as of thunder; the stones were dark grey in colour, and were ejected to a height of more than 1000 mètres. Others of less violence followed, and then an incessant roaring, rumbling, and thundering noise testified to power of the forces at work in the volcano and the new island. All approach to the region of the eruption was for the present out of the question, as stones had already been cast to a distance of 1000 mètres from the crater.

At the conclusion of the reading of these Papers, the PRESIDENT explained to the Meeting some drawings exhibited on the walls, which had been made from Dr. Schmidt's sketches, and which illustrated the position of the eruptions in the harbour of Santorin. He said that it was on record in history that the great central crater of the island was in a state of activity about two thousand years ago, and the probability was that it had been so before that time. The volcanic forces were quiescent for seven hundred years previous to the year 1650, when they again broke out. Another period of fifty or sixty years followed, until a fresh eruption took place in the year 1707, when the island of Nea Kameni was protruded from beneath the waters. A very complete account of the islands of Santorin and its neighbouring islets was published by Lieutenant Leycester in the 22nd volume of the Journal of the Society; it was, therefore, only proper that the event of a new eruption should be brought to the notice of the Society, and recorded in its publications. Lieutenant Leycester's paper was illustrated by an admirable map, constructed under the direction of Captain Graves; and subsequently all the geological phenomena had been well explained by Sir Charles Lyell. They had yet to learn how the present eruptions were to terminate. He regretted to hear from the last letter received from Mr. Erskine that the population of the island of Santorin, a most industrious people, were anxious to leave it, on account of the increasing violence of the eruptions, and the accompanying earthquakes and fissures in the ground. The President then called upon Captain Spratt, who had described the geological, antiquarian, and archaeological characteristics of the adjacent island of Crete, and who, from his long surveys in the Grecian Archipelago, was well qualified to speak on the subject under consideration.

Captain SPRATT said his acquaintance with Santorin consisted only in what he had observed during very short visits. Though he had been long employed on the Levantine survey, he had not been connected officially with the survey of the island of Santorin. He had, however, visited it two or three times. Its appearance, on approaching it, represented a flattened cake, elevated above the sea, in its central part, about 800 or 900 feet. Viewed from the sea it had no remarkable feature, except near its southern end. At that point there was a mountain, an uplifted mass of limestone, of about double the general height of the island. The exterior face of the island was in general a gradual slope towards the sea, and was for the most part even and uniform, and free from deep furrows or ravines. The slope was entirely covered with

vineyards, so that, among the Greek islands, Santorin was throughout the summer the most verdant of them all. The contrast between this exterior and the interior or western face of the island had no parallel within his knowledge. Santorin was separated from a lesser island to the west by a narrow strait. The larger island was anciently called Thera. The other island was now called Therasia, and there was a tradition that it had been broken off from the larger one during an eruption within the historical period. There was also an earlier tradition that both rose from the sea as one island. Therasia was connected with the larger one by a submarine plateau, that gave a complete representation of a crater, combined with the great depth of the sea in the enclosed area, as it reached a depth of more than 1200 feet. The three islands in its centre, which were the active part of the volcano within the historical period, were also connected with the main island by a submarine bank. This submarine plateau had two cones, which were supposed to have been cones of action at some period or other. Immediately surrounding the outer-harbour of the island from the north-western side, every where a beautiful verdure which fringed the exterior disappeared; there being a circle of dark precipitous cliffs, varying from 30 to 100 feet in height, formed of the scoria and débris of volcanic eruptions, ashes and tufa. The length of the large island was about nine miles. The internal diameter was nearly four miles, and the greatest width nearly seven miles. Sombre and dark as were these cliffs surrounding the crater, the three little volcanic islands in the centre of the bay were still more so, being coal-black rugged masses of basaltic lava. The first in part arose in the second century before our era, 186 B.C., and received additions until the beginning of the first century A.D. This is now called the Palaia Kameni. The newest of them, Nea Kameni, the central and largest of the three, originated in the year 1707. The eruptions connected with the formation of these islands were sometimes somewhat tranquil, and at other times rather violent as at present. A Jesuit in Santorin had given a very minute account of an eruption that occurred in 1650, that is about half a century before the appearance of the Nea Kameni, in the sea at $3\frac{1}{2}$ miles to the N.E. of Santorin, where there is now a shoal or bank, 60 feet below the surface, to indicate the spot, but with much deeper water all around it, and he related that the vibration was felt in Crete and in the islands of Nio and Zea, nearly 60 or 70 miles off. It was said that, in the snug little port of the island of Zea, a Turkish man-of-war was cast ashore, by the wave produced, and wrecked, such was the effect of the wave-movement that followed the rising of the submarine shoal, and the explosion that accompanied it. It was recorded also that at the island of Nio the wave rose to a height of sixty feet, throwing upon it much pumice, and washing high the steep sides of the island, and accumulating upon them a mass of the surface débris: very much like some of the sub-angular gravel-deposits found at the head of several of our estuaries. He considered that the phenomena connected with the upheaval of land and submarine areas, and the consequent effect of wave-movements, required more attention in the consideration of similar beds composed chiefly of superficial débris, and occurring within estuaries whose entrances were broad, but terminating in long and narrow creeks, with low and gradually rising shores as their confines. Further, in regard to the island of Santorin, as he had seen it stated in the newspapers that the inhabitants of that island generally lived in caverns burrowed within the soft deposits, he felt it necessary to say that such was not the case. The villages upon it were numerous and populous, and the houses were in general well built. In consequence of the extent of the cultivation and the vineyards, and their commerce, the inhabitants were wealthy, and therefore they could afford to build good houses, and to drink the very good wine they produced.

Mr. CYRIL GRAHAM said he had very little to add to the very lucid statement of Captain Spratt. He wished to call attention to the constant ebullitions which were taking place in the bay of Santorin. It had been the custom, when it was possible, to send our ships which were lying in the Mediterranean into the bay for a week or ten days, because the effect of the water on the copper resulting from the consequence of the gases with which the water became impregnated was the same as if they had been in dock and scraped. The population of the islands was about 16,000.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *Additional Notes on Formosa.* By R. SWINHÖE, Esq., F.R.G.S., H.B.M. Consul, Formosa.

MR. SWINHÖE has sent us the following notes of various excursions he has made in the island of Formosa, as supplement to his Paper published in the Journal, vol. xxxiv. p. 6:—

“1. *North-East Formosa.*—At the end of May I again visited Sawo Bay by sea. On the way we looked into Kelung: the cave there was explored with lanterns. Soon after passing the high arched entrance it divides into galleries, which consist for the most part simply of fissures in the rocks. The longest gallery was explored to its end, its length being somewhat over 500 yards. The passage is in many parts very narrow, and in others very low. Towards the end, from the overhanging limestone rock, a few stalactites of various length depended, and a few stalagmites were supported by the floor. A few fragments of marine shells of modern species lay about. Two small leaf-nosed bats were captured: these and one larger species were all that were seen. A viper, dotted all over with oval white spots, was the other animal seen inside: it opposed the entrance of the party, and was fortunately killed before it could inflict any mischief. This exploration satisfactorily settled the tale of the subterranean connection between this cave and the one at Tamsuy.

“We walked over the greater part of the small island, in the harbour called Palm Island, so called on account of the small palms (*Phoenix* sp.) that grow on conspicuous parts of its hilly surface. The remains of the Spanish fort are still to be seen in the inner corner of this island. A long low wall in ruins and covered with vegetation encloses about three acres of land, and in a corner facing the inner harbour, on raised ground, stand the remains of the cavalier. The space within the walls is cultivated. On the highest hill of the same island there are left only a few stones of what was once a small fort commanding the entrance and to seaward. Bush Island, a little to seaward of Palm Island, presents a flat surface of sandstone, cut into squares in chessboard pattern, the lines being in places well furrowed and looking like the rails of a railway, and the square patches of sandstone being marked with worn marks showing the play of water on their faces. This sandstone makes a very bad surface for the decks of ships, and lies in horizontal layers of from half a foot in thickness: the furrows are caused by the wearing away of the softer stone, which occurs in vertical strata at intervals between the horizontal strata of the harder kind, thus cutting them up into polyhedrous patches. The flat portion of the island is nearly covered at high water, showing only some large blocks of dead raised coral and two mounds covered with bushes, whence the name *Bush* Island.

Island. In the pools left by the receding tide Chinese fishermen were catching with hand-nets the small bright coral-fish, associated with mullet and other China coast-fish. Corals occur at a depth of 8 feet or so about this island. I got a Chinaman to dive for them: he went down head foremost, and with his two hands loosening the coral, raised it to the surface. I thus succeeded in making a fair collection, which I have since forwarded to the British Museum. In one large village on Palm Island several Chinese were married to *Pepo* women, or women of subdued aboriginal tribes. These women in appearance were very similar to those at Sawo.

"In steaming round to Sawo Bay we approached Steep Island, with a view of landing on it. The steamer went pretty close to the sandspit which runs out into a point westward from the island, but, finding no bottom, backed out again and continued her course. We entered Sawo Bay and made for the Lamhongo anchorage (the south inner bay), after all but running on to a huge hidden rock outside of the breakwater-reef. This rock is not marked down in the last Admiralty Chart, though it has only 3 feet water on it at half-tide. The southern harbour is full of coral-reefs and hidden dangers, and we were glad to make the best of our way out of it, anchoring finally outside the barrier-reef in deep water. Numbers of the *Pepos*, mostly women, came on board and begged and swam for empty bottles, which they called *brasko*. A similar word is used in Japan for bottles, and is probably derived from the Russian *flaskor* (Dutch *fleschen*, English *flask*). Some of these natives were nearly pure-blood with proper eyes, but others were more or less Chinese. They all conversed in the native language, though most of the males had their heads shaved, with tail appendage, and looked very Chinese-like. Since I was last here, in 1857, the village had increased in size, and a Chinese schoolmaster now resided there to teach the little *foreign* urchins the blank philosophy of Confucius. This man receives a small monthly stipend from the Chinese Government. As yet very little Chinese is spoken by them. Some of the older men still kept their long hair, and a few shaved just the forehead and tied up the long loose locks at the back. Their small and filthy huts were built within a stockade, with a crow-loft to watch against thieves. In a fresh-water pond near at hand the people bathe every evening, all naked together: their houses contained no bedsteads, chairs, or tables. A few boards laid on the mud floor supplied them with a bed, and their firewood and other worldly goods were piled away in the corners of the single room. These people farm scarcely at all; indeed here they have little ground for that purpose. Fishing is their chief occupation and source of subsistence. Just before dusk their boats chase one another out of the harbour, and during night, by the aid of bright torchlights, they take flying-fish along the coast. The spare fish they split and salt for sale and home consumption. They were evaporating salt from sea-water on the beach during the day. When the weather continues boisterous they are often driven to the extremity for food. They are obliged then to go out, all hands of either sex; old and young, shooting small birds. In the early spring they take large numbers of turtles (*Chelonia squamata*), which they dry for use. They appear merry and happy, and exercised all their arts of persuasion to win pipes, tobacco, and bottles from us.

"We next visited the larger Chinese village of Sawo, at the head of the bay. We landed to the left of the small river which here falls into the sea after meandering past Sawo village. It is merely a torrent from the neighbouring mountains. Up its barred mouth boats are drawn into shallow water. The boats used at Sawo and Kelung, as also at Tamsuy, are chiefly after the model of the Amoy *sampan*, the passenger sitting on a thwart towards the head of the boat with his back turned to the rower, who *stands* behind and pushes at an oar on either side, one in each hand. There is at Sawo also a species of canoe beaked fore and aft, which is mostly used by the *Pepos*, and is doubtless

of the form employed by their wild ancestors. It was somewhat after the idea of a Malay proa. The word for boat, at Sawo, is *burroah*=Malay *proa*. The small coasting junks are here, as in most parts of Formosa, especially adapted for contending with the surf, having high bulwarks and a high rounded head. We forded the shallow sandy-bottomed river, and traced its banks to the village, no great distance off, at the foot of hills thickly covered with long grass and copse. The village was long and straggling, with a fair show of comfort. Many of the houses were built of brick; and there was one long, respectable street of shops, containing ordinary Chinese commodities. A ditch ran round the back part of the village, and there were several bamboo crow-lofts about, to mount guard at night to give notice of the approach of prowling savages from the adjoining hills. The land in the neighbourhood was cultivated with rice, and several groups of buffaloes were observed both in the village and in the fields. The herdsmen that tended the cattle went out in small parties armed with spears. They told us that some savages had been lurking about for some days, and had killed five Chinese. One savage was secured and taken to the Mandarins at the district town, *Komalan Ting*. The Mandarins used to pay twelve taels (4*l.*) a head for savages, but they had since reduced the head-money to four taels (1*l.* 6*s.* 8*d.*). There was a female belonging to a savage tribe, having the tattooed face of a married woman, in a shop. She was captured in an affray, and seemed to be content with her present home. She had a small and well-formed aquiline nose, and keen horizontal eyes, but was in complexion rather darker than usual. Dressed, except about her head, like a China-woman, she was now the second wife of the Chinese shopman. She was shy, and tried to avoid observation. The savages lift cattle when they get the opportunity. A path-road leads from this village to Kelung.

"2. *South-West Formosa*.—Having had occasion to visit the Pescadores, in Her Majesty's gunboat *Bustard*, Lieutenant Tucker, to make enquiries about the supposed wreck of the *Netherby*, we continued our voyage to Takow, and thence down the south-west coast. This was in July, 1864, before I had removed from Tamsuy to establish the consulate at Takow, near Taiwan. We first steamed down to the South Cape, where we found the supposed harbour to be quite a myth. But more of the Cape hereafter; I prefer taking the places visited in sequence, according to position.

"We touched at Hongkong, between Lungkeaou and Ping-le. There is here a large Chinese village of Changchow men, who have few boats, and fish little. The hills all round them are densely wooded; but they have a valley among the hills, which they are permitted to cultivate by the savages on the payment of a tribute of one bag of rice out of every forty-five.

"We anchored in Lungkeaou Bay, and pulled to the central village, called Lungkeaou, which is somewhat removed from the beach. The village is walled, and I suppose contains about 1000 Chinese. It has a ditch round it, with plank-bridges crossing to the two gates. On the north side of the bay are two or three hamlets; these the Lungkeaou villagers warned us against, and said that beyond this bay southwards the Chinese squatters were beyond control, and not to be trusted. They begged us not to let the sailors bathe in the south-west corner of the bay, where the river stream is dammed at its mouth. The bushes there come down to near the shore, and the savages are said to lurk about them in the early morning. The Chinese of Lungkeaou, who came to meet us at the beach were themselves armed with spears and arrows. Indeed, it appears to be the custom in these parts to go about armed. They conducted us inside their village, which contained some fair specimens of the Chinese brick-built house, and seemed to enjoy a fair share of prosperity. Most of the women, from their style of headdress, appeared to be of savage descent, more or less removed. Next day we landed after breakfast with three blue-jackets (all of us armed), and with

two of the Lungkeau chief men, and a head-man from an adjoining village, who were armed with spears with narrow lozenge-shaped blades and short pole-handles, walked over paths through rice-fields to a small village about $1\frac{1}{2}$ mile distant. At this village the people, especially the women, looked more savage still. The men were shaven and *coiffed* like Chinese; but many of them, and all the women, were not far removed from aborigines. Most of them carried, inserted in the lower lobe of the ear, a large circular piece of wood, flat, and incised on its face like the pawn of an ordinary backgammon board, and about the same size, with a surface coating of silver. Some of the women had rings of small coloured glass-beads in their ears. All the females had their hair bound up with red silk-twist, and wound round the head in double coronet. The old people were extremely ugly. From this village we walked under a hot sun along the north bank of a mountain-river. The rocks on the north bank of the river were steep, and some of them finely laminated with narrow strata-like shale; over the side of these the path ran. The river rushed rapidly over the shingle, and at the foot of the steepest hill deepened into a quiet pool. From its banks we struck into a cart-road, which crosses the river at a shallow ford, and following the road through a picturesque shaded avenue, came out upon a paddock-like enclosure for cattle. Here two sturdy savage youths made their appearance. They had shaven heads, and were naked, with the exception of a curtain hanging from the waist in front and behind, the two pieces overlapping over the left hip, but leaving the right one exposed. They were armed with bows and arrows, and were plump in face and limb, rather brown in complexion, with a pleasant, though wild, expression in their faces. We were conducted onwards to the house of a Chinese settler, whence, after a halt, we were led to a small Kalee settlement. This consisted of one long hut, built of mud and thatched, partitioned inside by mud walls into separate houses, each containing one chief room and one side room. The rooms were small and low, and lighted only by the door. To one end of this long hut a few others of humbler type had been tacked on. The inside of the rooms contained a table, some rude benches, and a rough wooden board, with a mat over it, which served, without posters, mattress, or mosquito-curtains, for a bed. Their crockery consisted of a few blue-pattern Chinese rice-bowls. On the whitewashed walls were nailed stags' frontlets with antlers hanging on them, and the horns were used as rests for their gunbarrels, and for the long wooden stocks for the same. On the horn-srags hung the brass rings which run over and unite the barrel to the stock, ramrods with white-metal tops, pipes with carved bowls of bamboo-root, net-bags, &c. There was evident sign of Chinese civilisation amongst them, and a pile of freshly-gathered paddy in front of the house showed that they paid some attention to agriculture. These people belonged to the Onoojuy tribe of Kalees, having villages numbering in all about 10,000 persons, under the chief, *Tok-ke-tok*, and his four sons. They all shave their heads, and wear short queues, and are in friendly relation with the Chinese; albeit the two races do not trust each other, and never venture out of doors without some arm—either spears, swords, or bows and arrows. These *Kalees* acknowledge fealty to a woman, *Potsoo*, who is hereditary sovereign of all the Kalees. Her court is said to be held in the mountains near Taiwanfoo. I jotted down the following few words of their dialect:—

One,	Eta.	Six,	Unnum.	100 (one hundred) = Tai-tai.
Two,	Lusa.	Seven,	Pecho.	1000 (one thousand) = Koo-joo.
Three,	Tolo.	Eight,	Haloo.	Silver = Hwaneekoo.
Four,	S'pat.	Nine,	Siva.	Fire = Sapooy.
Five,	Lima.	Ten,	Polo.	

"There was amongst them a tall lad, with a silly Chinese kind of countenance, whom the Chinese described as half a fool. He had a large ring inside the

lobe of his ear instead of a pawn. He belonged to another race further north; the *Ah-meas*, or *Kahmees* (*Kwei-ying*?). But as he had been captured when quite a boy, he knew nothing of the language of his fathers. I was told it was ten days' journey to that country, and that the people there called fire *Lam-man*. The *Kweiyings* of the Tamsuy mountains use this word for fire, instead of the different variations of *apocoy* employed by the tribes of the Kalee race. In stature the *Kalees* in this neighbourhood varied considerably; some were tall and well-built, others short and broad. Some were a yellow-brown, as fair as the fairest working Chinese, some quite brown. Their faces, too, differed in form; some having large heads with broad lower jaws, like Malays; some heads approaching the Mongol type. Their eyelids in most cases were drawn down at the inner lids, and their eyes far apart. Their noses varied in shape, but were not pug and flattened, and not broad, but mostly of moderate size, the nostrils not much exposed, and the bridge of the nose about the middle. A little dark old man called forcibly to me: he was an individual among the *Kweiyings*, near Tamsuy, and seemed to be a connecting link between these otherwise differing races. The men had their heads shaved *à la Chinoise*, and their hair plaited into short queues, which they wore wound round their crowns, set off most tastily with red or white flowers and green plants. Their jackets were sleeveless, opening down the front, and fastened with Chinese knots and lobs. From their waist hung a short apron in front, and a similar one behind, as I have before described. The right thigh was exposed, to keep clear of the bowstring in shooting. Their bag-pouches hung on the left side, supported by a belt of small white-metal chains linked together, and set at regular distances with red cornelian beads, and extending from the right shoulder across the breast. A short sword with a one-sided scabbard was stuck through the girdle behind. Some carried spears, others a bow in one hand, and arrows without feather in the other. Blue, drab, and purple were the colours of their clothes. The lower lobes of their ears were pierced and greatly extended with pawn-shaped circular bits of wood, inserted one into each ear. The women's hair I have before noted. From their ears usually hung small rings of coloured beads, or stems of cotton, ending in red tufts, like those of the *Kweiyung* women. They, as well as the men, often wore bead-necklaces. They had on short jackets, with very short sleeves, and shorter than those of the men, in fact only just long enough to cover the breast. Their abdomens were exposed. They were girded with a cloth reaching to the knees, and overlapping in front. They were for the most part very similar to the women of Sawo. This hamlet was close to the foot of well-wooded hills, and was surrounded by a copse. We had some rifle and pistol practice, which astonished the savages, and induced them to shoot with their bows and arrows. Their bows are of the rudest description: they are made of tough wood, and have a notched rest in the middle for the string when loose to rest in. Their arrows are made of a strong kind of jointed reed, are about 2½ feet long, and have neither feather nor notch wherewith to plant it on the string. The iron head, shaped like a nail, a lance-head, or a shark's tooth, is stuck into one end of the reed, and fastened tight in with a binding of string. They are sharp, but carry true only to a very short distance. The savages would insist upon approaching the target within a few yards before they fired at it. They draw the bow with the two first fingers and thumb, and fire through the curved forefinger of the left hand which holds the bow. Their spears consist of iron lance-heads thrust into one end of a long bamboo or wooden pole, and tied tight round at that end with rattan and bamboo. Their swords are much the same as those I got near Tamsuy, and exhibited to the Geographical Society on a former occasion. No tattoo of any kind appears to be worn by the members of the *Choojuy* tribe near *Lungkeau*.

"We returned before nightfall. In passing the high hill that flanks the river, a large party of monkeys crossed the rocks above on all-fours from one cover to another. The rifles were uncapped, and we unfortunately missed the animals. They were the *Macacus cyclopis*, a species of which I have placed a pair in the Zoological Gardens, London. I collected two or three species of *Helix*, which I had not met in North Formosa. The largest of these was particularly common on the bushes by the road-side. From the large-leaved figs and other trees I got a few of a good-sized richly-coloured *Bulimus*, also new to my Formosan list. The foliage was in places very luxuriant. A large comb-backed lizard amused himself and disgusted me by clinging to my cheek while I sat under the shade of a hedge. The natives said it was poisonous, but I believe they were mistaken. The same lizard occurs at Takow, and I have captured it repeatedly with the hand without receiving any injury. The large long-bodied painted spider hung its immense yellow silk nets from tree to tree, as they do also at Takow. They live on moths, butterflies, dragonflies, and the larger insects. The nets are very strong, and it is peculiarly unpleasant running your head against one. On my return to the plain from the hill valley, we passed a village a little to the southward and westward of *Lungkeou*. This was peopled by *Hakkas*, colonists from north *Kwangtung* province, and a few of the older men spoke very fair Mandarin. The head-man of this *Hakka* village showed us a letter from a Dutch captain, who had been into the bay and got provisions from his people. The letter was written in Dutch and English, and spoke in good terms of the kindness he had met with. It was the people of this village who some years back had received and protected from the savages the crew of the *Larpen*, which vessel was wrecked on the south coast. They were for this good act shortly afterwards handsomely rewarded by the British Government, who sent Mr. (now Sir Harry) Parkes there in a steamship of war for the purpose. The villagers alluded frequently to the *Larpen* affair in their conversation with us. Below *Lungkeou* we saw no more villages on the coast. The hills are lower, and in some places quite denuded of trees, and a hut or two here or there speckles the shore. The South Cape affords only an indented bay. We could find nothing approaching a harbour, the water being deep quite close to the land. There was a good deal of treeless land here, but we could see only one hut. A few rafts, with two Chinese apiece, were floating on the bay, the Chinese being engaged in fishing. Those people were frightened, and would not come near us. We held a shouting conversation with them. They spoke of a village of some size inland, and declared that there were no savages in that neighbourhood. This last, however, was not true, as a party from the *Dove* surveying-gunboat were only the other day fired upon by a crowd of savages at the South Cape. One sailor received rather a severe wound, and the boat the *Dove's* people were in got a good deal riddled with the savages' bullets, which were found to be made of foreign lead. Towards the south-west point of the Cape, on the bay side, is a curious rock, looking at a distance like a large stone-built mansion. It projects from the hill, and seems to be composed of large horizontal slabs of limestone, superincumbent on vertical slabs of the same. This is the famous Chess-board Rock of the Chinese, on which some assert having seen the Genii of the hills playing at chess, though probably such genii were nothing more than monkeys. Off the south-east point and some way to seaward a heavy tide-ripple occurred, the water chopping and jumping, though the sea was smooth and calm. The water was deep blue, and the current moving northward. During summer at least part of the *Kurosiwo* Stream would appear to run up the west coast, but it is not exactly the same steady flow that runs on the east side, and is more or less overwhelmed by the downward set of the China Sea. Lammy Island, or *Little Lewkeu*, as the Chinese call it, is in formation very

similar-looking to the Ape's Hill range, and the *Rover's Group* appear to have characters intermediate between the Pescadores and this. The Pescadores are mostly flat-topped islands, from 100 to 300 feet high, formed of trap and basaltic rock, the strata of the latter occurring in two or three layers with gravel between. *Panghoo* island, viewed from the north-west has a cone-shaped hill, a little flattened at the top, with a small rock on its centre, and resembles in form a female's nipped breast. Table Island is generally basaltic, the basalt being disposed side by side like stakes, a small peak peaking out on one side near the top. The rock is of a dark hue. Most of the islands have green tops, and are terraced for cultivation on every available side. Some of them have sandy beaches; the sand being white and gritty, like that of the China coast, and not black and fine like that of the Formosa shore.

"I cannot drop the subject of Formosa without saying a few words on the progress of the survey, under the attention of the man-of-war *Swallow* and *Dove* tender, which vessels (thanks to the kindly interposition of the Royal Geographical Society) the Hydrographic Office lost no time in detailing to our island. These two vessels did not, however, fairly commence the coast-line till April. The *Dove* first ranged the coast south of this to the Cape, while the *Swallow* crossed over to Amoy for a cargo of coal; then the *Dove* was left to map the harbour, while the *Swallow* ranged the coast north of Taiwan. This last vessel, however, owing to the lateness of the season, did not get over much more than half the ground between Richards' and Gordon's surveys. Mr. R. Wild, Master commanding, was instructed to survey the treaty port of Taiwan, but considering that he could not much benefit the roadstead off Taiwanfoo by a special survey, he consented to devote a chart to Takow Harbour, which was much in need of a good survey. Mr. Stanley, commanding the *Dove*, has kindly given me a tracing of the Takow chart for my office, and Mr. Wilds has promised me similar tracings of the south and north coast, and Formosa Channel. The chart of Takow is an excellent piece of work, and shows that no labour has been spared to ensure its correctness. It comprises, besides the harbour, the approach from the sea."

2. Letter from Mr. R. B. N. Walker from the Gaboon.

MR. R. B. N. WALKER, who is exploring, under the auspices of the Society, the interior of Western Equatorial Africa, has at length set out on his journey from the Gaboon, and explains his prospects in the following letter to the Secretary:—

"Gaboon, W. Africa,
Dec. 23rd, 1865.

"SIR,

"After many delays and disappointments, I am at length able to inform you that the preparations for my departure are completed, and I propose crossing the river to join my guides and carriers on the 26th inst., and shall proceed into the interior immediately.

"My original plan of ascending the Bogwé Branch of this river to its source, and thence travelling by land, I have been compelled by circumstances to change; and now propose starting from the head of a creek called Obélo, on the southern side of this river, and crossing thence on foot in a south-east direction so as to strike the Ogowé or Nazareth (some 80 miles from my point of departure), in the Adjomba country, whence I shall proceed as directly eastward as circumstances will permit.

"This plan has two great advantages: in the first place, from all that can be learned from the natives, the Ogowé comes from a much greater distance inland than any other river in this neighbourhood, and very probably has its

source in the reported lake,* the discovery of which, and the determination of its position, are the first objects of my journey; and secondly, the Adjomba and other tribes inhabiting the region which I shall traverse for a considerable distance, and during a considerable portion of the time occupied by my journey, speak the Mpongwe language, thus rendering me quite independent of interpreters; a matter of no little importance in visiting for the first time a totally unknown country.

"The supplies I take with me will, I trust, enable me to remain at least a year in the interior; and I shall use every exertion to reach the lake, and travel over as great an extent of country as possible. I cannot presume to say what will be the distance I may be able to penetrate; but, if not so fully successful as I hope to be, I shall not be discouraged from making a second attempt with larger means.

"I am compelled to take more people with me than I originally contemplated, as I shall have not less than forty loads on leaving this; but as the coast people are more likely to prove a hindrance than otherwise, I shall send all but some eight or ten back from the Adjomba country, where I hope to obtain fresh carriers at a cheaper rate. Amongst the number of those who will accompany me during the whole of my journey is one pretty well practised in the preservation of objects of Natural History, so that I hope to be able to accomplish something in that branch of science.

"I am sorry to say that the aneroid having been injured accidentally, I had to send it to England to be repaired; I fully hope, however, that it will come out by this month's mail in time for me to receive it ere commencing my journey.

"Communication with the coast will, I fear, be impossible; but should an opportunity present itself, I shall not fail to give you information of my proceedings.

"R. B. N. WALKER, F.R.G.S."

3. *Journey into the Interior of Australia, North-West of the Great Bight.*

By Mr. E. A. DELISSER.

(Communicated by Dr. F. MUELLER, F.R.G.S., Melbourne.)

"Melbourne, Dec. 16th, 1865.

"At your request I have the pleasure to forward you a short account of my late trip beyond the Great Australian Bight.

"The expedition which left Melbourne in January, 1865, under my command, had a double object to effect—to explore the country inland from the Bight, and to sink for fresh water on some claims taken by Messrs. Degraives & Co. near to Fowler's Bay and the head of the Bight. I started early in the year for the purpose of taking advantage of the earliest rains, but there was none until the first week in April: and although from that time until the first week of October we had sufficient rain along the coast, it did not penetrate into the interior beyond an average distance of 30 miles; but I don't think that this country suffered more than other parts of the continent from drought this year. While waiting for a general fall, I had wells sunk along the coast between Wahganyab and the Bight, and got good water at Coynebrā in some sand-hills on the coast within 13 miles from the Bight; thus making the journey between Fowler's Bay and the head of the Bight comparatively easy for packing up the provisions.

* This lake, reported by the natives to lie in the interior, east of the Gaboon, is estimated by Mr. Walker to be about 500 miles distant from the coast, and he thinks it likely a chain of lakes exists in this direction. A native had informed him that he had visited a lake, distant three months' journey from the head of the Gaboon, and so vast that the opposite shores were not visible. The discovery of these large sheets of water is the main object of Mr. Walker's expedition.—[Ed.]

Having waited until June, I determined to take Mr. Hardwicke, one of the party, with me, and to lead out three pack-horses, as far as they would go, in the event of being unsuccessful in finding water, and to return without them on our tracks, hiding water and flour at alternate camps going out.

"Leaving one man in charge of provisions and remaining horses at the Bight, I started with Mr. Hardwicke, on the 23rd of June, from a small limestone-hole named *Kūtnā*,* which I had found in 1862, and to which place I had packed out a few gallons of water. From here I went a course about N. 60° W. until the 29th June, when, having entered scrubby country the evening before, I turned north to get over some small hills covered with timber,—myall, sandalwood and *Sheyaks*. The next day, the horses not being able to go further, and having exhausted our stock of water, we were compelled to retrace our steps the whole distance we had traversed, without finding any surface-water.

"The chief feature of the country passed over is the immense plain, which I have called the Nullarbor Plain from its being destitute of any trees, and which, commencing a few miles from the coast, extends such a long distance that we went 150 miles from the head of the Bight before we entered a dissimilar country. This plain, within 40 miles from the coast, is in general well covered with the salt-bushes, *Atriplex* and *Kochia sedifolia*, which grow from 1 foot to 2 feet high, and in places is well grassed; the ground is undulating, and the higher portions generally covered with *Eremophila scoparia*. Throughout the whole plain basins, like clay-pans, from a few feet to 2 or 3 acres, occur, in which, within 60 miles of the coast, samphire *Samolus* and *Pittosporum phyllioides*.

"The rock immediately under the surface is limestone, and throughout a large portion of the country we met numerous caves, the air from which at daytime, especially in hot weather, issues forth with great force; the noise from one of them was so loud that we could hear it 200 yards away, and, at the entrance, the blast took our hats off. We remarked that at night the current of air sets into the caves. From their number I should judge that this portion of the country is composed of blocks of limestone enclosing large vacant places. No doubt there is water in some of these caves, but in the few we examined the numerous fissures prevented us from reaching the lowest levels. The appearance of the small basins clothed with timber have a pleasing effect; the trees often cannot be discerned until quite close to the basins, in others they considerably relieve the monotony of the plain. The soil from the commencement of these basins appears gradually to improve, saltbush (*atriplex*) gives place to *Kochia sedifolia*, and the grass becomes thicker and greener, the proximity of timber most probably being the cause. The soil on the timbered hills is a very red sand, and wherever there were any open patches the grass looked well; a few feet below we found limestone. The *Sheyaks* were as fine as any I have seen in South Australia; and I believe, from the number of kangaroos, parrots, and remains of natives' fires, we were not far from water when we were obliged to return. The latitude of 'Peelunbee' was taken by observation, but that of the termination of our trip is by calculation, as, in consequence of the almost certainty of having to leave extras behind, I did not take my sextant out.

"E. A. DELISSER.

"I have not yet received the information promised me by Mr. Selwyn, to whom I gave the few fossils I carried away, but the whole country is a tertiary limestone formation.

"Granite was found about 30 feet at a well 2 miles from Pindubba, or about 14' N.N.E. of Fowler's Bay."

* *Kūtnā* is about 40' N.W. of Yeer Cumban Cowie, at the head of the Bight.

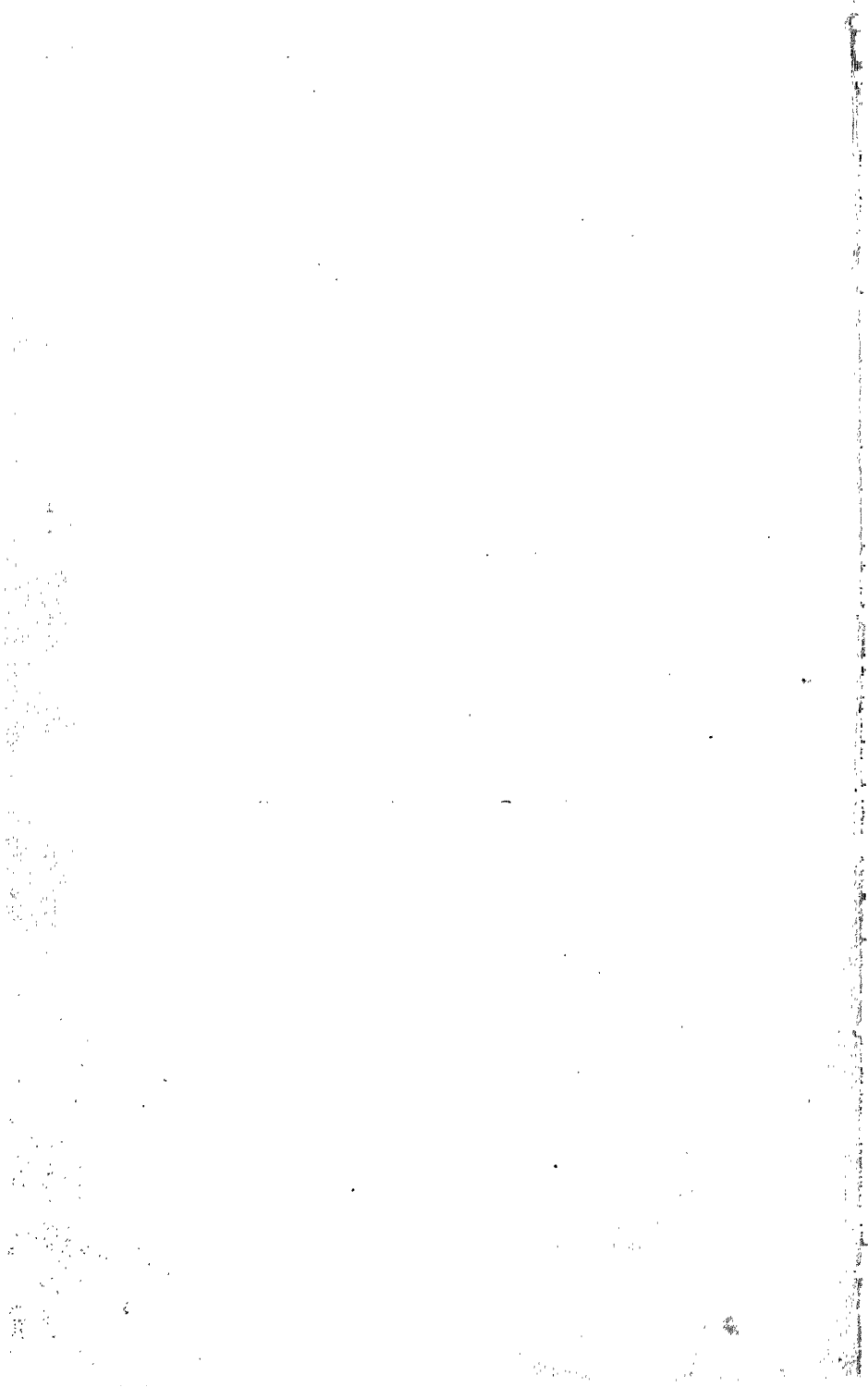
4. *Note on the Site of the Ruins of Brahminabad in Scinde.*

By J. BRUNTON, Esq., C.E., F.G.S., F.R.G.S.

MR. BRUNTON has sent to the Society a short communication on the subject of the position of the ancient city of Brahminabad, and enclosing a map of the province of Scinde, and a MS. copy of a report on the subject of the ruins, written by Mr. A. F. Bellasis in 1856, and published in the Transactions of the Bombay Branch of the Royal Asiatic Society. The ruins are situated on a branch of one of the old dry beds of the Indus, and, according to observations taken by Mr. Brunton, in lat. $25^{\circ} 55' 30''$ N., long. $68^{\circ} 48'$ E. The existence of these extensive ruins is known to few Europeans, and their position had never been marked on any of the maps of India, therefore the map presented to the Society's collection by Mr. Brunton, in which the site is marked in MS., is of especial value. As a result of his survey, the distance of the ruins from the chief neighbouring places must be corrected as follows:—

From Shadadpoor	11½ miles.
„ Halla	27½ „
„ Hyderabad	43 „

Mr. Brunton adds that the few slight excavations which he was enabled to make confirmed the views of Mr. Bellasis, to the effect that the city was destroyed by an earthquake.



PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

[ISSUED, JULY 14TH, 1866.]

SESSION 1865-6.

Ninth Meeting, March 26th, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in
the Chair.

PRESENTATION.—*Rev. J. Hudson Taylor.*

ELECTIONS.—*Edmund Francis Davis, Esq. ; John Dunn Gardner, Esq. ;
Rear-Admiral C. Baillie Hamilton ; Charles Alston Messiter, Esq.*

ADDITIONS TO THE LIBRARY SINCE THE LAST MEETING, 12TH MARCH, 1866.—‘*Voyages de Hiouen Thsang*,’ 2 vols., par M. Stanislaus Julien. Presented by Her Majesty’s Secretary of State for India. ‘*A Descriptive Treatise on Mathematical Drawing Instruments*,’ by W. F. Stanley, Esq. ‘*A Visit to the Suez Canal*,’ by T. K. Lynch, Esq. ‘*Madagascar and the Malagasy*,’ by Lieutenant S. P. Oliver, R.A. All presented by the authors. ‘*Note di un Viaggio in Persia*,’ vol. I., by F. de Filipppe. Added to the Library by purchase. ‘*The Imperial Gazetteer of England and Wales*,’ 2 vols., and Atlas. Presented by Messrs. Fullarton and Co. ‘*Observations on the Commerce of the American States*,’ by John Holroyd, Earl of Sheffield. ‘*Remarks on the Husbandry and Internal Commerce of Bengal*,’ by H. T. Colebrooke. ‘*Les Antiquités d’Arles*,’ par M. J. Sequin. All presented by S. M. Drach, Esq., F.R.G.S., &c. Continuations of ‘*Journals*,’ ‘*Transactions*,’ &c. &c.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING.—Map of England and Wales, by Fullarton, Part 2. 5 sheets of the Government Map of Sweden, scale, $\frac{1}{100000}$. Admiralty Charts and Ordnance Maps up to date.

The PRESIDENT, previous to the reading of the Paper, announced to the meeting that he had received very satisfactory letters from Dr. Livingstone,

who had arrived safely at Zanzibar, and was preparing to proceed to the interior of Africa. There had been only one drawback to the success of his expedition. Through the kindness of the Governor of Bombay and our countrymen there, Dr. Livingstone had provided himself with a number of buffaloes, thinking they would be particularly useful to him, from their being safe from the attacks of the *tsetse* fly, which destroys the native cattle; but unfortunately nine of those animals had died. Dr. Livingstone was, nevertheless, in high spirits when he wrote. He (the President) hoped that he would meet with the same success as on former occasions, when he had been without the services of buffaloes or other animals.

The Paper of the evening was as follows:—

1. *Observations on two Memoirs recently published by M. Veniukof on the Pamir Region and the Bolor Country in Central Asia.* By Major-Gen.

SIR H. C. RAWLINSON, K.C.B., M.P., &c.

SIR HENRY RAWLINSON commenced by saying that the subject to be brought forward this evening was one which was curious, not only in a geographical, but in a literary, and to some extent, he might say, in a political point of view. The countries between the northern frontiers of our Indian possessions and the Russian empire have for many years past been regarded with very considerable interest, but no part of that intervening space had excited so much curiosity as the portion lying between the following boundaries:—Kashmir and Afghanistan on the south, the valley of the Jaxartes on the north, Turkestan on the east, and Bokhara on the west. This region of country is marked in many maps as a *terra incognita*. It was not, however, totally unknown, for a certain degree of information, as they would presently see, had been obtained from various sources regarding it. Geographical sportsmen had been merely accustomed to regard it as a manor which had been very little shot over,—one moreover abounding with game, and to the covers of which, accordingly, they were very desirous of obtaining access. Under these circumstances, English geographers had been recently much surprised to learn from Russian sources that a detailed description already existed of a great part of this region, and so authentic appeared the announcement that it became the duty of the Geographical Society to inquire into the nature of these new materials, with a view to placing the information which might be obtained from them at the disposal of the public. The result of our endeavours to obtain such information had led to the present communication.

It appeared that, some four or five years ago, notices had been published in the Russian papers, and in Russian periodicals, concerning some remarkable travels through these little-known countries. The first intimation he (Sir Henry) had of such notices

was derived from a note published by Mr. Michell in his work entitled 'The Russians in Central Asia,' which note was copied from a Russian memoir by M. Veniukof, published in the Proceedings of the Imperial Geographical Society of St. Petersburg. Shortly after this M. Khanikof, the well-known Russian Orientalist, who takes much interest in the prosecution of Geographical as well as Oriental science, wrote a letter on the subject to Sir Roderick Murchison, which he (Sir Henry) had now in his hands. In this letter Mr. Khanikof gives an account of a certain manuscript which he had lately had an opportunity of examining, in the archives of the topographical department of the Ministry of War at St. Petersburg; and which appeared to him so extraordinary that he thought it advisable to draw up an abstract from it, and send it at once to England to be submitted to the Geographical Society of this country, with a view to elicit information on the subject. He (Sir Henry) would now read an extract from the translation of the paper by M. Veniukof. After discussing the geography of Central Asia, and the difficulty of getting information concerning it, the writer says,—

"I here allude to the 'Travels through Upper Asia from Kashgar, Tashbalyk, Bolor, Badakshan, Vokhan, Kokan, Turkestan to the Kirghis Steppe, and back to Kashmir, through Samarcand and Yarkend.' The enumeration alone of these places must, I should imagine, excite the irresistible curiosity of all who have made the geography of Asia their study. These fresh sources of information are truly of the highest importance. As regards the 'Travels,' it is to be inferred from the preface and from certain observations in the narrative that the author was a German, an agent of the East India Company, despatched in the beginning of this, or at the latter part of the last century, to purchase horses for the British army. The original account forms a magnificent manuscript work in the German language, accompanied by forty sketches of the country traversed. The text has also been translated into French in a separate manuscript, and the maps worked into one itinerary in admirable style. The Christian name of this traveller—Georg Ludvig von ————appears over the preface, but the surname has been erased. Without entering into details respecting these materials, I shall proceed to give extracts from that portion which relates immediately to the Bolor and the surrounding region."

Now the announcement that there was extant a volume of travels, illustrated by forty sketches of the country, and, he might add, rendered further valuable by a series of thirty astronomical determinations of latitude and longitude, referring to all the most important sites between the English and the Russian frontiers, was an attraction of irresistible interest to geographers. It certainly seemed extraordinary that a country at which we had been nibbling from the frontiers for the last fifty years, should all the time have

been, as it were, at our disposal throughout its whole extent. But the announcement was so circumstantial that we could hardly doubt of its accuracy, and the Geographical Society accordingly at once took steps for placing the materials before us, by requesting Mr. J. Michell, a young man of great promise, and thoroughly acquainted with Russian, to translate for the Society the two papers published by M. Veniukof, in which copious extracts from the mysterious German manuscript were given. The translation is now finished, and he (Sir Henry) had the papers on the table, and would read extracts from them, as he proceeded with his remarks.

Before, however, entering on any Geographical discussion, he felt it necessary to say a few words on the general question, which was one of considerable interest and importance. If this manuscript were genuine, it was one of the most valuable contributions to our knowledge of Central Asia that had ever been given to the world; on the other hand, if it were not genuine, it was one of the most successful forgeries that had ever been attempted in the history of literature. The subject was so fraught with difficulty, arising from the nature of the arguments on one side and on the other, that although he (Sir Henry) had studied it for weeks and for months, and had gone through the task of tracing step by step the route of the supposed German traveller, it was only recently that he had arrived at a definite opinion, and that opinion was that the *Travels* were nothing more than an elaborate hoax. But he must warn the meeting that, in stating this to the Geographical Society, he took upon himself very great responsibility. The *Travels* had been accepted as perfectly genuine in Russia. The most skilful and experienced Geographers and Orientalists of that country had accepted the alleged discoveries without hesitation. Maps constructed from these *Travels* had been adopted by the Russian Government as the basis of their great maps of Central Asia. The rivers and mountains, and names of places which were given by the anonymous traveller had been drafted into these maps, and from them transferred to the German maps, and from the German to the English. The great map of Central Asia, for instance, recently published by Kiepert of Berlin, dealt very largely in this material; and even Stanford's map of Central Asia, the best we have in England, accepted many of the Geographical features, taking them, in all probability, from Kiepert.

Sir Henry's condemnation might appear very decided, but he thought that after a detailed examination of the text of the manuscript '*Travels*' it would be allowed to be well founded. There were in the first place a number of incredible statements

at the outset about the object of these Travels. It was stated, for instance, that a German officer resident in India had been employed by the East India Company at the commencement of the century,—having under his orders a certain Lieutenant Harvey, and an escort of forty Sepoys,—to obtain a large supply of horses for the Government service. It was said that these gentlemen proceeded with the Sepoys into Central Asia, and obtained 130 horses in one place and 980 in another, which were duly forwarded to India. The German traveller afterwards represented himself as having endeavoured to reach the Russian frontier in the prosecution of his journey, having sent back his escort and Lieutenant Harvey. He was attacked in the Steppe by the Kirghis, and obliged to return to Samarcand, from whence he passed by Kashgar and Yarkand and Kashmir, to India.

Now, as a preliminary step to enquiring into the truth of these statements, he (Sir Henry) obtained permission at the India Office, to have a search made in our official records, with a view to the identification of the individuals concerned; and the result of that search was that there was no transaction of the sort to be traced. There was no German employé in the Indian service at the time stated; there was no requisition for horses; and there was no Lieutenant Harvey in the army during any part of the period to which the narrative could be referred. This negative evidence rather staggered him, and further consideration confirmed his doubts. He reflected that at the time in question Upper India was in the hands of the Mahrattas, and Kashmir was in those of the Affghans. To have sent a small escort of forty Sepoys through such countries into the wilds of Central Asia was therefore a moral impossibility. And for what purpose was the mission to be sent? They were to obtain horses for the Government service; but the only horses procurable in Tartary are what are called Kirghis *Yaboo*s, a sort of stout ponies, which are serviceable enough as pack-horses, but which are quite unfit for cavalry purposes. Moorcroft and Trebeck proceeded afterwards, it is true, into Central Asia in search of a particular breed of horses that it was thought advisable to import into India. But it was not to the Pamir plains, the country of the *Yaboo*s, that their steps were directed, but towards Bokhara and Khorassan, where Turcoman horses of high breed could be obtained. Moreover, the mountainous and difficult country where the German traveller states he purchased his first batch of horses is one through which it would be impossible to convey the animals to their destination. He talks, indeed, of purchasing and transporting his horses—132 being obtained in the heart of the mountains, and

980 in the Pamir Steppe near Lake Karakul—as if he were travelling in a civilized country intersected with high roads; but the very reverse is known to be the case. The locality, indeed, where he describes the first batch of horses as having been purchased is in reality in the centre of a mountainous country where a horse was never heard of; the only animals used by the inhabitants being yaks. He says that he there obtained 132 horses, and despatched them to India in the custody of Lieutenant Harvey; but they were plundered by the Mahrattas on the way to Calcutta, and on his returning to claim the price of them, the claim was refused, and he got into trouble with the Government in consequence. It was owing apparently to this misunderstanding that, according to his own showing, he left the service of the Indian Government and went to Russia, where he deposited this manuscript in the archives. But the whole story is so suspicious that there is no trusting it. To make out a “prima facie” case of authenticity, it would be necessary, indeed, in the first place to identify the individual who wrote the manuscript, and it must be required moreover of the Russian authorities to show how that manuscript got into their archives before they can expect us to give any credit to the statements it contains.

But, on the other hand, the question arises, If this is a forgery, what could be the object of it? and this is a point that Khanikof, in discussing the subject with him (Sir Henry), pressed upon him very strongly. He met the allegation of forgery by the simple question, “*Cui bono?*” Unless the man were a monomaniac, why should he have devoted a life to the mere purpose of imposing upon geographers?

Another circumstance which is, it must be admitted, in favour of the authenticity of the document, is the elaborateness of the narrative, and the appropriateness of the local names. On the Kashmir frontier we find Thibetan names. In the mountains the nomenclature belongs to the Kaffir language. In Badakhshan we have Persian vocables; and the etymology of the Turkish names to the north is unexceptionable; in one instance even we have a genuine Zungarian title. All this shows that the author, if an impostor, must have gone through an enormous amount of reading and careful study to have prepared a Journal with so great an amount of verisimilitude. The country being practically but little known to us, and means being thus wanting for tracking the traveller's footsteps, stage by stage, he (Sir Henry) had long doubted as to the true character of the narrative, and occasionally even now a transient impression would come over him that, after all, the Travels

might be genuine. However, he was fortified in his suspicions by the opinions of thoroughly competent judges. Among these he might mention Lord Strangford, who had looked over the manuscript with much care, and agreed with him that the travels were apocryphal. As he had said before, the country described by this anonymous author was not altogether unknown to us. The English had been for some time past very much interested in the countries to the north of India; and there had thus been a large amount of information concerning them accumulated in one way or the other—either in regularly published works or in papers in scientific journals. He had made out a list of such authorities, in order that geographers who desired to investigate the subject farther might see what a repertory of geographical knowledge could be brought to bear upon it.

In the first place, there was Elphinstone's 'Account of the Kingdom of Cabul,' with Macartney's Map and Memoir. When Elphinstone was sent to Cabul in 1808, he was supposed to have possessed the most accurate and extensive information of any man of the time, regarding the statistics and geography of the countries on the North-Western frontiers of India. He had been employed for years past in the political department of Northern India; he had access to all the public records, and in fact it was for some time previous to his mission his special vocation to collect information on these regions. Now, if when Mount-stuart Elphinstone was preparing for his journey, there had been in existence any such information as that a German employé and a Lieutenant of the East India Company's service had been into Central Asia, was it conceivable that he should have known nothing about it, especially as the German traveller says he sent duplicate copies of his maps and papers back to India with the horses from the Pamir Steppes? This was one of the most cogent arguments against the authenticity of the narrative; for it was Elphinstone's especial duty to collect all preliminary information available in India before he departed on his mission, and he started on his journey not a year and a half after the date of the manuscript in the St. Petersburg archives.

After Elphinstone's there appeared another very important work on the same countries, namely, the 'Travels of Moorcroft and Trebeck.' These gentlemen travelled extensively in Central Asia, and collected a large mass of information regarding the countries on the North-Western frontiers of India; and Horace Hayman Wilson, than whom there never lived a more accurate or laborious critic, published and annotated their travels after their decease; yet not a trace, either in Wilson's notes or in Moorcroft and Trebeck's

Journals, is there to be found of this previous mission of the German and his coadjutor Lieutenant Harvey.

The books and papers which he (Sir Henry) had studied in order to fit himself for discussing this question, and ascertaining the authenticity or otherwise of this manuscript, were the following:—

1. Elphinstone's 'Cabul,' with Macartney's Map and Memoir.
2. Leyden's 'Baber,' with Waddington's ditto.
3. Wilson's 'Travels of Moorcroft and Trebeck,' with Map (vol. ii. part 3, chap. vi.).
4. Vigne's 'Travels in Cashmere and Ladak, vol. ii., c. ix. (with Map).
5. Wood's 'Journey to the Sources of the Oxus,' with Map.
6. Burnes's 'Cabool,' with Kaffir Vocabulary.
7. Cunningham's 'Ladak and surrounding Countries,' with Map.
9. H. Strachey's paper on Thibet, with Map, *Geographical Journal*, vol. xxiii.
9. Captain Raverty's papers in the *Bengal Asiatic Society's Journal* on Kafiristan, 1859; Swat, 1862; and Cashkar or Chitral, 1864; also his later paper on the Kaffir language in the same *Journal*.

10. Paper on the progress of the Cashmir series, by Captain Montgomerie, drawn up by order of Sir A. Waugh, in *Bengal Asiatic Society's Journal* for 1861, with Sketch Map (a very useful paper for notices of Gilgit and Yassin).

Thomson and the Schlagintweits may also be consulted for the Geography of the Kara-Korum range, and Godwin-Austen in the *Royal Geographical Society's Journal*, vol. xxxiv., for the glaciers of the Muz-takh; Court's paper on the Kafirs, with Map, in *Asiatic Society's Journal* for April, 1839. Amongst native authorities the most valuable notices are—1. Mir Izzet Ollah's *Journal*, edited by Wilson, in the *Royal Asiatic Society's Journal* for 1843; 2. Khwaja Ahmed Shah's Narrative of his Travels from Cashmire by Yarkand and Kashgar to Bokhara and Cabul, published in the *Bengal Asiatic Society's Journal* for 1856; and lastly, the Report of Abdul Mejid's Journey from Peshawer to Kokan and back, printed in the *India Government's Political Records* for 1861. And last, not least, is the compilation, lately published by Mr. Michell, and consisting of translations of Russian documents relating to the Geography and Political History of Central Asia. Also notice Gardner's *Journals* published by Mr. Edgeworth in the *Bengal Asiatic Society's Journal* for 1853.

The Second volume, Part III., Chapter VI. of 'Moorcroft and Trebeck's Travels,' is especially devoted to the countries between Kashmir and the Oxus; and the 9th chapter, 2nd volume, of Vigne's 'Travels in Kashmir' is devoted to the same subject, and contains a mass of valuable information concerning it. Wood's journey is also full of interesting matter relating to the same region. Cunningham's 'Ladak,' again, is a most admirable work; and Henry Strachey's 'Memoir' is the most valuable of all papers on the geography of Thibet.

There are three papers, also, by Captain Raverty, in the *Bengal Asiatic Society's Journal*, which deserve especial notice. Although Captain Raverty himself was only on the frontiers of the countries

which he describes, the papers he wrote regarding them contain a mass of most accurate geographical and statistical information, and do him great credit. He seems to have had the art of extracting from his native informants all that they knew of real value, and he has shown great skill in arranging his materials so as to make them generally useful.

Thus it would be seen that although we had no person who had actually travelled through the particular tract of country described by the German anonymous writer, yet investigations had been made all around it, both by Europeans and natives, and the mass of information we had obtained from these united sources was such, that if any person like Mr. Arrowsmith, brought up in the study of practical geography, would take the trouble to test and compare the several routes and supplement them with the miscellaneous information otherwise available, we might have a thoroughly trustworthy map constructed of the countries between the Russian frontier and the Indus, a work which, Sir Henry added, was still a desideratum in geography. The last paper cited on the above list was also remarkably curious and very little known: this was the Journal of Mr. Gardner. Now, Mr. Gardner was an Englishman, who appeared really to have travelled some 30 years ago in a zigzag fashion through all the countries between Samarcand and Kashmir; but he kept his Journals in the most eccentric style, and no doubt exaggerated grossly. In the form in which the journals are now published, they are hardly of any use; but they may still be some day, it is to be hoped, reduced to order. Mr. Gardner, indeed, is still living in India, and he (Sir Henry) trusted Mr. Edgeworth, his editor, would obtain from him further materials to verify his various routes, and amend the vicious orthography which now disfigured the Journal.

Sir Henry then stated that, having given this preliminary sketch, he would proceed to read certain portions of the journal of the so-called German traveller. He remarked that if we had a man writing a journal of travels in a known country, we could of course trace him day by day and step by step, and there could then be no question whether the narrative were authentic or not; but, unfortunately in the present case, wherever the ground was accessible to direct inquiry this anonymous traveller was vague in the extreme; whilst, on the other hand, when he was once launched on a "terra incognita" he was proportionally diffuse and circumstantial. For instance, the extracts from the Travels that have been alone furnished to us commence from Kashmir. That is a country which we now know pretty nearly as well as India itself.

It has been, indeed, lately triangulated and mapped, under the direction of the Surveyor-General, Sir Andrew Waugh, as carefully and almost as minutely as England has been mapped by the Ordnance Survey. As the author, then, starts from Kashmir we can join issue at once, because we are there on known ground and can test his accuracy from our own knowledge of the country. He begins by saying, "Having quitted Srinagur, the capital of Kashmir, on the 8th of May [the date of the year not being given]. . . . I passed on the 9th of May in sight of a volcano, Darmundan, which is always smoking and throwing up stones, but rarely emits flames." Now he (Sir Henry) would ask our Kashmir travellers, and he saw many of them present at the Meeting, if there was any such thing in the whole valley as an active volcano. The notice of a volcano within a day's march of Srinagur was a direct proof of mendacity. Then on the 10th he crossed the Indus below the embouchure of the Luimaki. This again is noteworthy. He leaves Srinagur, he it observed, on the 8th, and he crosses the Indus on the 10th. Now, the direct distance from the town of Srinagur to the nearest point of the Indus, cannot be under 120 miles; Godwin-Austen occupied twenty days in marching from Srinagur to Iskardo, and he (Sir Henry) believed the Indus could not be reached from Srinagur at any point under fifteen days; yet this writer pretends that he crossed the great river on the second day. Then, again, he speaks of the Indus as the "Sindu;" while in reality there is no such specific name as the Sindu known in that country. The word "Sindu," indeed, in the language of Kashmir simply means "river." The Indus is there called the Senge-Khabap, "the Lion Cataract," or the Gyamtsa, "the big river" of Thibet. The writer then proceeds to say, "When we approached Sindu (from the south-east, the direction of Srinagur), we saw rising in front of us five high snowy mountain summits; these were, namely, Satchar, Olatam Imbra-Embura (the Seat of God), Ardud, and Damarit; all these were tinged with purple by the rays of the sun." Now these names are one and all unknown, but there is at least some ingenuity in the invention of the name of "Imbra-Embura, the seat of God;" *Imbra* being the real Kaffir name for God. The only misfortune is that there are no Kaffirs within 200 miles of the frontier of Kashmir.

It is remarkable, indeed, that from the time he leaves the Indus our traveller never sees any Mahomedans—the natives are all heathens; whereas in reality, with the exception of the small community of Kaffirs north of the Cabul river, all the inhabitants from the Indus to the Oxus are Mussulmans. Our traveller continues—"To the left of these mountains, and high above the whole country,

rose the Bastam Bolo Mountain"—Here is a bursting name for the purpose of attracting attention! He (Sir Henry) would like to know what language that belonged to—"whose summit, to the middle of its snow-line, was encircled by white clouds, all the other peaks standing out visibly in all their splendour. Before us extended the broad valleys of the Sindu and Luimaki, whose meadows spread away like bright green carpets." In reality the Indus in this part of its course flows through narrow and precipitous gorges, where there is hardly footing for a mountain-goat, and can only be crossed by rope-bridges. There is certainly no ferry across the Indus, from the mouth of the Gilgit river to the frontiers of Hazareh. "On the high and sloping southern bank of the Sindu river could be descried the villages of Parabira, Sarlumba, Tarilumba, and Barilumba." (Here we have another ingenious attempt at deception, "*lumba*" being an affix in the language of Baltistan signifying "a mountain torrent," and is thus extensively used in the north of Little Thibet; but as far south as the Kashmir frontier the word appears to be never met with.) "The lower hills being clad with silver firs, cedars, and other fine trees, gave the valleys a charming and picturesque appearance." (Compare with this sylvan scene Vigne's description of the bed of the Indus at Acho.) "The blue stream of the Sindu, which is here 75 fathoms broad, flows on from east to west, interrupted occasionally in its course by rocks. The ferry-boats by which the river is crossed are two fathoms in length and of equal breadth; three or four inflated goat-skins are fixed on each side, and a large branch of a tree answers the purpose of a rudder. I did not succeed in finding the bottom in the centre of the river with a line 18 fathoms long, and even within a few fathoms of the bank the depth exceeded 7 fathoms. After crossing the Sindu we were finally clear of all Afghan jurisdiction and all Mahomedans. It was near an old town on the right bank of the river that we first touched the soil of the Chashgur-Gobi, a free and pagan race, remarkable for their hospitality, and who are continually harassed by their Mahomedan neighbours. Some of the older inhabitants of Gurbar villages, situated close to Olotam Mountain, keep guard at the above-named tower from sunset to sunrise, after which they return to the village, all further vigilance being unnecessary, as no person would venture to cross the river during the night. One of the Indians I had brought with me from Kashmir understood the Bili language, which is spoken here"—The "*Bili*" language is here first brought to our notice, but none of our philologists or geographers know of such a language. In the works of Vigne, of Cunningham, and of Raverty, vocabularies

will be found of all the mountain dialects between the Indus and the Oxus, but the "Bili" will be searched for in vain—"and with his assistance I was able to converse with the Gurbar guards at the tower; their dress consisted of black goat-skins"—this is taken from the known dress of the Kaffirs—"beneath which they wore a short shirt and wide and long drawers of chequered woollen stuff, and drawn close round the ankles. Their weapons were spears and large bows and arrows. Suspended on their right side was a long and broad sword, and a dagger-stick on the other side completed their equipment. Their head-dress consisted of a felt hat of irregular shape, narrow brimmed and turned up at the sides. A strong smell of leather, moreover, pervaded their presence. The first question they asked us was whether we were Mahometans: which, to their great delight, we answered negatively. . . . Here they offered us some dark-coloured wine, which they drew with a silver cup, out of large jars, and which we found to be very good. . . . The head man carefully inspected the whole of our party. . . . Becoming at last convinced of the truth of our statement, he expressed the liveliest pleasure, and at a given signal all the five pagans began jumping about in a strange fashion and exclaiming, "Imbra-bolli, Gish-bolli."—"Imbra," as before stated, is a real Kaffir word for God, and must have thus come from some genuine source. The author soon after resumes his journey, and the narrative proceeds thus:—"Advancing higher up the Luimaki we perceived a stone pillar with an inscription, the characters of which had nothing in common with Indian letters; the pillar occurred half-way up the valley, on the right side of the road; the rows of characters in it ran from top to bottom, and I concluded they were Chinese, but as I have no particular knowledge of this language I may have been mistaken."—Now this account, which would be most interesting if true, seems to be quite incredible. There is no alphabet in the East which runs in a vertical direction except the Chinese, and to find a Chinese inscription on the Peshawer frontier may be put down as a moral impossibility; but the compiler of these travels may have heard of the Kapur-da-giri inscriptions in the Yussufzye country, and may have introduced the notice of them into his own narrative without a very clear notion of the characters employed. "After proceeding three parasangs beyond the pillar we reached the village of Mestopan. . . . This is the last village of the Chashgur-Gobi, and, clustering close to the side of the mountain, resembles a swallow's nest. The flat stone roof of one habitation forms the court-yard of another above, in which manner all the villages of the Gobi tribe are built. The climate

in the lower part of the valley was mild and pleasant, but above I found it inclement and cold, owing to the proximity of lofty snow-capped mountains. The pastures, however, were very rich, and large flocks of sheep and goats were to be seen grazing on them. The natives here weave a narrow dark-brown cloth, called *daneh*, out of fine goat's wool, they also dress and prepare sheep and goat skins very skilfully, something in the manner of morocco leather. The smell of their leather is stronger than the Russian 'Yafta,' hence all the natives who employ it in their dress have a strong leathery smell about them, which may be pleasant to those who are fond of it, but which to me was very disagreeable. Several pillars with large human faces cut on them, representing the features of the dead, stand on a small knoll beyond the village; these figures are covered with tatters of cloth, and offerings of provisions are placed round them. This holy place is called Immer-Umma."

On reading this description, he (Sir Henry) thought he remembered the last-mentioned words; and he referred accordingly to Mr. Elphinstone's account of Kaffirstan, and he there found (Elphinstone's 'Cabul,' vol. ii., p. 397) that Moola Nejib, who had been sent from Peshawer to report on the Kaffirs, applied the name of "*Imr-Umma*" to the houses or rude temples in which their sacrifices take place, the name merely signifying "the house of God."—Although the Kaffirs described by Elphinstone did not occupy at all the same locality as the Gobis of the German traveller, still this coincidence of name applying to their respective temples was remarkable, and seemed a strong proof of authenticity. The narrative, however, went on to say—"Our arrival at the village was celebrated by fresh votive offerings of a black rabbit and a large snipe." And this passage destroyed any confidence to which the former coincidence might have given rise; for a rabbit—and especially a black rabbit—was an animal entirely unknown in the East, and could not possibly have been met with in the highlands of the Indian Caucasus.

Other points on which he (Sir Henry) has tested the authenticity of these Travels were the distances. The traveller, for instance, states that he left Srinagur on the 8th of May, and arrived at Kashgar on the 11th June, that is to say, in thirty-five marches. Now we must deduct ten days from this amount for the time during which he was not travelling. He remained, as he tells us, three days at Mestopan on account of very bad weather, three days at Balgi through a quarrel with the natives, two days at Kulsha, buying horses, and two days at Takhtomar through a second quarrel with the natives. That leaves twenty-five days for travelling from

Kashmir to Kashgar. Now, it must be borne in mind that there really is but one open practicable road from one of these points to the other. This is a road which runs from Srinagur to the Indus at Bonji, follows up the Gilgit River by Gilgit and Shirni to Yassin, crosses a range to Mastuch in the upper Chitral valley, then crosses the great range into Badakhshan, descends upon the Oxus, and follows up that river to the plateau of Pamir, which it traverses till it reaches Kashgar. From the best means he (Sir Henry) had of calculating, this route would occupy, in travelling, fifty days, or forty-five days at the very least. The route of Abdul Mejid, whose narrative would presently be read, conducted from Peshawer to Kashgar, very little less in actual distance, and he was three months on the journey—actually travelling sixty-five days. Yet this German traveller pretended to have passed by a much more difficult track, through the mountains, in twenty-five days. If that were the only objection to the document it would, in his (Sir Henry's) opinion, be fatal.

The narrative, as it continues, gives a variety of curious details which have certainly a general air of truth, although now and then occurs a passage which betrays the fictitious nature of the whole story; while with regard to the geography it is so utterly confused in the earlier portion of the narrative that no argument can be drawn from it, either for or against. The manner, however, in which the manuscript is stated to have passed into the hands of the Russian Government is remarkable, and requires some investigation. It is said that the German agent on one occasion sent 980 horses to Kashgar for the East India Company, but whether they ever reached India or not he omits to tell us. He states, however, that the first batch of 130 horses which he sent to India, under charge of Lieutenant Harvey, were plundered by the Mahrattas; that the Government, however, did not credit this story; and on his reaching India, accordingly, they refused to pay him, in consequence of which some very unpleasant discussions arose between them. This disgusted him so much that on his return from Calcutta he passed on to Russia, and out of pique placed his maps and journals in the hands of the Russian Government; though how this betrayal of his trust could have injured the English it is not very easy to see, for there is not throughout the narrative a single political allusion; and besides, at the time of the transactions in question, the beginning of the present century, no jealousy whatever had arisen between the Russian and the English Governments in regard to Central Asia. We were very suspicious at that time of the intrigues and machinations of France in the East, but

with Russia we were on terms of alliance and confidence, so that the pretended explanation of jealousy between us and Russia, of which our discontented agent could take advantage to enhance the value of his revelations, breaks down altogether, and stamps the whole story with unmistakable fraud and fabrication. It need hardly be added that, if genuine, the Travels as contributions to geography would have been equally interesting both to Russians and English.

Passing on to the pseudo-traveller's arrival at Kashgar, a large city and a place of great importance, the account that he gave of Kashgar struck him (Sir Henry) as a singular combination of truth and fable. He gave, in the first place, a very accurate table of the relative distribution of the inhabitants, showing an amount of local ethnographical knowledge which could only, as it would seem, have been acquired by personal observation; but in other respects he seemed grievously at fault. He stated, for instance, that the city contained only 1500 houses, and numbered, amongst its 15,000 inhabitants, 325 Armenians, who had a fine stone church dedicated to St. Sogien, and built in 1615. Now, we have had many accounts of Kashgar, some of them from native agents, and especially from M. Valikhanof, son of a Kirghis Sultan, who had been educated in the Russian service, and was an undoubtedly reliable authority; and all these authorities combined in giving the number of houses as about 16,000 instead of 1500, and the number of inhabitants as over 60,000. It was impossible also to believe in the existence of an Armenian colony at Kashgar in the beginning of the present century. Neither in the Chinese, nor Russian, nor native accounts, was there any allusion to such a colony; and it might be added that there was no St. Sogien known in the Armenian calendar. There were other discrepancies, too, in this Armenian story which discredited the whole narrative.

It remained to notice what was one of the most remarkable features in the anonymous narrative, namely, a list of thirty astronomical positions, calculated accurately to a second, both as to latitude and longitude. Now, any geographer must know that to keep a register of observations over a number of months, of latitudes and longitudes, was a very difficult affair indeed, requiring great care and much leisure; and he (Sir Henry) would venture to say that, travelling, as the German writer professed he was, in such a wild country, and amongst such wild tribes, the thing was wholly impossible. It was to be observed, too, that he never alluded in a single passage to his being provided with a sextant, or a quadrant, or a chronometer, or with any instrument whatever, necessary for

these determinations. There was not, indeed, a single actual observation given: but only the results. There was no account of any register of observations, nor of taking lunars, nor of any of the machinery by which the positions were determined. Now, M. Khanikof, who was an experienced astronomer himself, seemed to lay great stress on these observations as evidence of good faith. Finding, indeed, that the latitudes were all in error about thirty minutes, he conjectured that this error arose from the observer's not taking into calculation the diameter of the sun. But in reality there is no evidence throughout the whole narrative that the writer ever took a single observation. He merely gives a list of latitudes and longitudes at the end of his narrative, without any indication whatever how they were obtained; and his silence in this respect was one of the most suspicious features of the case. Sir Henry then stated that the time did not permit of his following the footsteps of the German traveller in any detail through the second portion of his pretended journey, namely, from Kashgar by Badakhshan to Kokand. The narrative, however, presented the same strange combination of truth and error which he had brought to notice in his previous remarks. The ascent of the Yaman-yar River, from Kashgar to the Lake of Kara-kul (the "Dragon Lake" of the Chinese) seemed to be genuine, but the description of the town and river of Bolor were probably fictitious. The positions, moreover, of Badakhshan ("Fyzabad" of Wood) and Vokhan were reversed, the latter being far to the east of the former, instead of to the west, as the "Travels" and longitudes would seem to indicate. Again, that there was ever a Chinese garrison in Badakhshan, as stated by the German, is opposed to our historical knowledge; and Malik Shah Buzurg resided at Fyzabad, and not at Vokhan. In continuation, the extent of the Pamir Steppe seemed to be much too contracted, and the positions of Tanglak and Terek-chai were transferred from the north to the south of the plateau; and it was further suspicious that in pursuing the valley of the Jaxartes to Kokand there was no mention of Oosh, or Marghilan, or any of the other large towns of the district.

Sir Henry, in conclusion, read to the Meeting the following passages from the Report of a real traveller in these regions, to show the difference between bonâ fide statements and the ingenious inventions of the German author. The traveller in question is Abdul Medjid, an agent who was sent in 1861 by the Indian Government with answers to certain letters received from Kokand. The Report is compiled by Major James, and has been printed in the 'Political Records of the Indian Government.' It is really full of

geographical interest to those who occupy themselves with the subject of Central Asia, and deserves the especial notice of the Royal Geographical Society. Major James reports as follows:—

“There are five routes by which Kokan may be reached from Peshawur, the most easterly is that by Cashmere and Ladak, crossing the Kara Korum range to Yarkand; this is the most circuitous. The second proceeds from Peshawur, through the Bajour and Upper Koner valleys, into Badakshan; this is the most direct, but, upon the whole, the most difficult route. It was taken by the Envoy who came from Kokan in 1854, because the easier routes to the westward were closed against him, in consequence of the existing state of relations between the Ameers of Bokhara and Cabul and the British Government. On his return to Kokan, he selected that by Cashmere and Yarkand. The three remaining routes proceed in the first instance to Cabul. The most westerly passes through Balk and Bokhara to Kokan: this is the best route of all, and is that taken by traffic; the only lofty range to be crossed is the Hindoo Koosh, and the road is practicable for laden camels throughout; indeed after crossing the Oxus, wheeled carriages are in ordinary use; but inasmuch as the relations between the Ruler of Kokan and the King of Bokhara, and those between the latter and the Ameer of Cabul, were not on a friendly footing, it was not advisable for the party to adopt it. The other two routes—which are known as those of Pamir and Kolab—after crossing the Hindoo Koosh, lead through Koondooz to Badakshan, and there diverge. The eastern extremity of the valley of the Oxus is separated from Yarkand and Kashgar by a chain of mountains which supports an extensive tract of elevated table-land, and connects the Hindoo Koosh with the lofty range to the south of Kokan. This table-land is called the Pamir Steppe, and gives its name to the first of the above-mentioned routes which rises to it from Badakshan, and, after crossing its dreary plains, descends by the Taghlak or Teeruk Pass into the Kokan territories twelve marches east of the capital. The Kolab route crosses the Oxus north of Badakshan, and proceeds direct by the Kolab and Derwazah districts to the mountain range south of Kokan, crossing it by the Oshkoorgan Pass, four marches south-west of Kokan.

“Our party proceeded by the Pamir route, and returned by that of Kolab.

“Entering the Badakshan territories by a steep and rugged pass, he arrived at Rostak on the 31st of October, where Meer Yousuf Allee resides, a brother of the Meer of the country; this chief is very highly spoken of, and gave a warm reception to the party. He shortly after met with a tragic end, being slain by a nephew of weak intellect, together with other relations, as reported in the Diary which accompanied my No. 23 of 20th March last. Here the Moolla received intelligence of the death of the King of Bokhara, and was delayed four days on account of the rumours which followed that event, of the unsettled state of the neighbouring districts. On the 4th November he arrived at Fyzabad, the capital of Badakshan, and residence of its ruler Meer Shah, by whom he was hospitably entertained for two days, and furnished with an escort.

“Nine more marches through a mountainous country brought the party to the Punjab Fort, the residence of Meer Shah's brother-in-law, Shah Ameer Beg, where most of the mules and ponies were exchanged for ‘yaks,’ or the

large-tailed bullocks; here too the real difficulties of the road commenced, and the travellers were not much inspirited by the tales they heard of the exploits and adventures of the Kirghiz robbers; snow had already fallen, and the road would soon be closed. On the 16th of November they ascended to Lungur Wakhan, which is the beginning of the Pamir Steppe.*

"This region forms the summer pasture-lands of the Kirghiz and the hunting-grounds of freebooting parties. Troops of the latter sweep over the plains and carry off into hopeless slavery the surprised travellers, without respect to age, sex or rank; the captives are sold in the cities and villages of Kokan and Kashgar; between them and their homes are extensive deserts, and flight is rarely attempted. The slaves are vigorously worked, but Kirghiz wives are given to them, and the families they obtain are further ties to their new country; the majority of slaves in Kokan are Budakshanees, and the chiefs of the latter country make reprisals on the Kirghiz, reducing their captives to the same kind of slavery and furnishing them with wives of Badakshan. Thus two of the men sent by Shah Ameer Beg with the Moolla as guides and assistants were Kirghiz slaves; they now had families in Badakshan, and the chief felt that he ran no risk of their escaping on the road.

"The nomad tribes who bring their flocks and herds of sheep, goats, camels, and horses to the steppes in the summer, pitch their black tents (called *khirgah*) wherever pasture is procurable; they are described by the Moolla as strange uncouth fellows, who live on mare's milk and horse-flesh. They had now left the steppes, and our party fell in with only one of their camps, where they met with such treatment as showed that a Kirghiz *khirgah* on the Pamir is to be avoided rather than sought for.

"Fourteen weary days were occupied in crossing the steppe; the marches were long, depending on uncertain supplies of grass and water, which sometimes wholly failed them; food for man and beast had to be carried with the party, for not a trace of human habitation is to be met with in these inhospitable wilds. The Kirghiz guides, furnished by Shah Ameer Beg from Punjab, were seldom at fault, but hurried on the party for fear of fresh snow falling, when it would be difficult to follow the track, and the whole would be likely to perish. The Moolla has given a very quiet statement of their difficulties and sufferings on this portion of the journey, but they were evidently of no ordinary character; the season was already advanced, and most of the road was even then covered with snow; the cold was intense, and on more than one occasion they passed the night as best they could, without a stick to burn or any kind of shelter; at some stages grass and water were not procurable, and three of the animals died on the road.

"The steppe is interspersed with tamarisk-jungle and the wild willow, and in the summer with tracts of high grass. Scattered over its surface are extensive lakes, the sources of the streams which, flowing eastward, fall into the rivers of Kashgar and Yarkand; two of these were passed by the party at

* As far as this point, the Moolla has followed the exact track of Wood, as described in his 'Journey to the Source of the Oxus.' Punjab is Wood's "Kila Punj," and "Lungur Wakhan" is Wood's "Lungur Kish." On ascending the Pamir Plateau, Wood proceeded due east to Sir-i-kul (probably Sari-kul, "yellow lake") and the Moolla N.N.E. to Kurreh Kul (probably Kra-kul or "black lake").—H. C. R.

Khûrgoshe and *Kurreh Kol*, the former was one day's ride in circuit and the latter four days; the Moolla also crossed the Moorghabee River about midway in the steppe. In the vicinity of this river and the lakes deer and wild fowl abound; on such a journey they must indeed have proved welcome resting-places.

"One of the chief dangers to travellers in the steppe is caused by a noxious wind which prevails at certain seasons, called Dummuk, and the Moolla was cautioned, before leaving Punjab, never to sleep lying down; the effect of the wind is said to be that it causes swelling pains and sometimes insensibility: one of the party was seized with these symptoms during a storm.

"Snow, which had long threatened, fell at length on the last day's journey, which was accomplished with the greatest difficulty; the storm was violent, and the animals could hardly wade through the fresh snow or face the hurricane; all trace of the road was lost, and the party took refuge on a hillock, whilst the guides went in search of the track. They had been marching since daybreak, and it was now 2 P.M., but as the Moolla graphically relates, 'all forgot hunger in looking after life.' The guides returned with the intelligence that a herd of horses had been seen, and the party made for the spot; they found eight men only with the herd, and with difficulty procured shelter, in the khirgah, from the stormy night.

"On the following day, the 30th November, the spirits of the party revived, on finding themselves suddenly at the termination of the steppe: they were on the crest of the range south of Kokan, and commenced their descent through the Taghlak Pass. The road being covered with snow and very steep, was difficult to traverse, and men and animals were constantly falling. The lower slopes were covered with fir-trees, in a forest of which they found shelter for the night, in a cow-shed, where for the first time, his supplies being now exhausted, the Moolla felt himself obliged to overcome his scruples, and to dine off a steak of horse-flesh.

"On the 1st of December the party arrived at length in an inhabited country, and were fairly in the Kokan territories; still, however, there were no permanent dwellings, and the country, known as Osh Tippah, is occupied by the El-Bai Kirghiz, a tribe of wandering shepherds and herdsmen, whose pasture-lands are on the slopes of the adjacent mountains. The daughter of the chief received them courteously; and the Moolla remarks that, throughout the country, the women are not concealed, but take their share in all work, and 'wear turbans like the men.'

"On the 5th of December they arrived at Goolshah, the first town they had met with. It is the residence of Alim Beg, a relative of the ruler, who had gone with an expedition to the Russian frontier; they were kindly received and hospitably entertained by Alim Beg's wife for two days. Badakshanee slaves were numerous in this household; many of whom had families, and seemed contented enough, but some wept much when they talked of their own country. The remaining seven marches were through a finely cultivated country with large towns and villages; they were well received by the local authorities, though Khodai Nuzzur Beg did his best on more than one occasion to obtain for his companion a less favourable reception.

"On the 17th of December the Moolla entered Kokan, after a continuous journey of nearly three months.

"On the 31st of January, 1861, the Moolla left Kokan, and was informed that an envoy would overtake him at Yar Mazar, the third march.

"The Kolab route having been fixed on, they crossed the Kokan range by the Koksoo or Drawoot Pass; in the seventh and eighth marches the road was deep in snow at this season, and very difficult. They passed through the hilly districts of Karataghin and Derwazee, both tributary to Kokan, and found the road difficult throughout; in some places the snow had to be beaten down by troops of animals before the party could pass.

"Having made twenty marches from Kokan, they arrived in the Kolab district, the independent chief of which is Surrah Khan, who is very hostile to the Cabul Government, and maintains friendly relations with Bokhara. With a view, therefore, of evincing his enmity to the former, and of ingratiating himself with the latter power, this petty chief caused the whole of the party to be seized at Khwaling, a town in his territory. For four days they were treated with rigour, kept separate from each other, and stinted in their food; they were afterwards placed together and treated well, though detained against their wishes for more than three weeks. Intelligence then arrived of the rebellion in Bokhara, and of the summons to their aid of the Affghan Sirdars by the people of Shuhr Subz. As it seemed probable that his friend would lose his power, Surrah Khan became as anxious to conciliate the captives as he had formerly been to cast indignity upon them. He at once released them, sent costly entertainments, and dismissed them with dresses of honour.

"The remainder of the road was good, and, crossing the Oxus on the third day, they passed through a portion of Badakshan and arrived at Khanabad, where they were again received with hospitality by the Sirdar Mahomed Azim Khan, and after a halt of five days set out for Cabul, where they arrived on the 6th of June; leaving that city on the 14th, they arrived at Peshawur on the 26th of June."

Mr. TRELAWNEY SAUNDERS spoke a few words in defence of the delineation of the part of Central Asia in Stanford's Map of Asia which had been founded on the map of the anonymous traveller. This part related almost exclusively to the course of the Bolor River, the course of which he maintained was laid down with every appearance of correctness.

Mr. CRAWFURD said there was no doubt about the document of the German writer being a gross and flagrant imposition, but that some adventurer, who has withheld his name, had been employed on the Russian Government, less informed than it is now, and the countries which lie between it and the Russian dominions. He (Mr. Crawford) perfectly well remembered every public transaction which took place on the northern frontier of India sixty years ago, namely, during the years 1805, 1806, and 1807, which was about the time that the German gentleman pretended to have been there, for he was himself at the time on the spot. He never heard of a foreigner being employed to buy horses for the army, and he was quite sure there was no Lieutenant Harvey in the service. With regard to the mention of a volcano, he (Mr. Crawford) believed there was not one in all India; and the nearest point to the Pamir countries at which one could be seen was the Bay of Bengal, which was at a distance of 2000 miles. He was satisfied there were no rabbits to be found in Central Asia. The rabbit was not indigenous in any part of India. As to the black rabbit, it was a complete imposture. The whole account was a bungling, awkward imposture, and the Travels a mere sham.

The PRESIDENT, in returning thanks to Sir Henry Rawlinson for his able analysis of the memoirs of the unknown German author as translated by M. Veniukof, said he could only account for the credibility attached to that narrative by such an able Russian geographer as M. Khanikof, by the circumstance that neither he nor any Russian geographer had explored the region of Pamir. As, however, this rugged, lofty, and sterile country lies midway between the British and Russian frontiers, he confidently hoped that its true geographical features would soon be accurately defined by the geographers of both countries, so that we may no longer have to speculate on the degree of truth which ought or ought not to be attached to the writings of so mysterious a person as the unnamed and unknown traveller of the beginning of the present century.*

Tenth Meeting, April 23rd, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

ELECTIONS.—*William W. Blow, Esq.; John C. C. Boyd, Esq.; Hugh Cleghorn, Esq., M.D.; Edmund Foster, Jun., Esq.; George H. Gibb, Esq.; Robinson Hudson, Esq.; William G. M'Ivor, Esq.; John Keith Rennie, Esq., M.A.*

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, 26TH MARCH, 1866.—‘A Directory for the Navigation of the Indian Ocean,’ by A. G. Findlay, Esq. ‘Histoire physique, économique et politique du Paraguay, et des établissements des Jesuites,’ par M. L. A. Demersay. ‘Address delivered before the Maine Historical Society, 28th August, 1863,’ by G. Folsom, Esq. ‘Sur l’État de l’Atmosphère à Bruxelles, 1865,’ par M. E. Quetelet. ‘What shall we do with the Hudson’s Bay Territory?’ by T. Rawlings, Esq. ‘Notice of an Account of Geological Observations in China, Japan, and Mongolia,’ by R. Pumpelly, Esq. All presented by their respective authors. ‘An Account of the ancient and ruined City of Brahminabad in Sindh, situated on a Branch of the old bed of the Indus,’ by A. F. Bellasis, Esq. Presented by J. Brunton, Esq., C.E., F.R.G.S. ‘Voyage au Pole boréal, fait en 1773,’ par Constantine-Jean Phipps. Presented by E. Whymper, Esq. ‘Ten Months in the Fiji Islands,’ by Mrs. Smythe; with an Introduction and Appendix, by Col. W. J. Smythe, R.A., &c. Presented by the authoress. ‘A Catalogue of Authors who have written on Rio de la Plata, Paraguay, and Chaco,’ collected by Dalrymple; with additions by Sir W. Parish, K.C.H., &c. Presented by Sir Woodbine Parish, K.C.H., &c. ‘Beschryvinge van den Grieschische Archipel,’ door den R. v. K. Presented by

* With regard to the subject of this evening’s discussion, it will be necessary to consult a recent letter from M. Khanikof, which will be printed in the current Volume of the ‘Proceedings.’—ED.

S. M. Drach, Esq., F.R.S., &c. 'Claudius Ptolemy and the Nile,' by A. D. Cooley, Esq. Presented by the author. 'Die Pflanzen der Pfahlbauten,' von Dr. O. Heer. Presented by J. M. Ziegler, Esq. Continuations of Journals, Periodicals, &c.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING.— Sources of the Nile: copying of an ancient map by Girolamo de Verazano in 1492, preserved in the archives at Rome. Presented by Baron Jochmus. Second Part of Fullarton's 'Imperial Atlas of England and Wales,' on 2 sheets. Presented by the publishers. Map of Buenos Ayres, on 6 sheets, by Don Saturnino Salas, Hon. Corr. Mem. R.G.S., 2 copies. Presented by the author. Map of Jamaica, by J. Arrowsmith, Esq. Hypsometrical Map of Switzerland, with letter-press, by J. M. Ziegler, Hon. Corr. Mem. R.G.S. French Charts, 19 sheets. Ordnance Maps, 91 sheets.

The PRESIDENT said he had the pleasure of announcing that he had received from Australia much more favourable accounts than had heretofore come to hand of the progress of the expedition, led by Mr. McIntyre, in search of the remains of Leichhardt's party. The news received a few weeks ago was very unfavourable, and led to the supposition that, as all the horses had perished, the expedition might have to be abandoned. It appeared that for many years there had never been such a drought as had occurred last year, in that part of Australia through which the expedition was proceeding, and the horses died absolutely from want of water. The camels, however, had been preserved, and the party had now reached a well-watered grass country; and having been again properly equipped, they were starting to go westward through a country in which it was expected they would meet no more obstacles. He mentioned this subject because the Council of the Geographical Society had advanced 200*l.* in aid of the search for the relics of that very notable expedition under Leichhardt, and possibly to assist in saving the lives of some of the party. Her Majesty the Queen was so much interested in this question that she had subscribed 100*l.* towards the same object. Other subscriptions (including one of 25*l.* from Mr. Cardwell, H.M. Colonial Secretary) had been received; and when these were announced in Australia they would go a great way in making the colonists feel the deep interest we took in any expedition which they had set their heart upon. It was always his endeavour to keep up, as much as possible, a right feeling between the great Australian colonies and our own country. The colonial Governments had indeed subscribed most munificently to support this expedition.

The following Papers were then read by the respective authors:—

1. *Notes on Peking and its Neighbourhood.* By W. LOCKHART, Esq.,
F.R.C.S.

THE author, who stated that he resided several years at Peking as surgeon in the hospital established to afford medical aid to the Chinese by the London Missionary Society, commenced his paper by an historical sketch of the city. He then gave a detailed account of its present state. In speaking of the annual visits of the tribu-

tary chiefs with their retinues, he first described the manners of the Mongolian visitors. The attendants bring with them large quantities of frozen game, also butter packed in the intestines of animals, and felted blankets made of wool and camels' hair. It was curious to see the Mongol officers prefer to have their camels' hair tents pitched in the court-yards of the houses allotted to them, and use the rooms of the houses themselves merely as outhouses, saying that the tents were warmer and more comfortable than the rooms. This embassy always came early in the winter. The next embassy in point of importance is the Korean. The ambassador is attended by about 200 officers, servants and traders, and the whole escort travels in carts from Korea round the head of the Gulf of Liautung, occupying 30 days on the journey. The traders bring for sale large quantities of the peculiar tough Korean paper, which is used for windows instead of glass, besides thick cotton-cloth and a large amount of gold-dust. They dress chiefly in light-coloured clothes, the officials in silk, and the traders in white calico, and their high-crowned broad-brimmed hats are beautifully made of very fine slips of bamboo, varnished black, and held together by horsehair; they also wear a kind of hair-net or cap made of beautifully worked horsehair.

The climate of Peking is very dry for the greater part of the year. Very little rain falls in the spring. In June, July, and August there are heavy thunder-showers and floods; in the autumn again there is but little rain, and from November to March no rain at all, and very little snow. The amount of annual rainfall is from 26 to 30 inches. The thermometer rises, in June and July, occasionally to 100° Fahr., the average maximum for those months being about 90°; and the greatest cold experienced during three winters was 6° below zero. During the winter the ice is usually two feet thick. The elaborate system of open watercourses and drains constructed by the first builders of the city are now in a ruinous condition, and no water runs through them.

The walls of the inner or Tartar city are built of large bricks, and consist of outside retaining walls enclosing a mass of earth and stones, which has a thick layer of concrete at the top, and this is covered with bricks. The wall thus constructed is 36 feet high, having a parapet of 6 feet on both sides. The breadth at the top varies from 40 to 52 feet, and is widest on the north side of the city. The circuit of the walls of the Tartar city is $14\frac{1}{2}$ miles; the extent from north to south $3\frac{1}{2}$ miles, and from east to west $4\frac{1}{2}$ miles. There are nine gates; three in the south, and two in each of the other sides; the central south gate, or Meridian Gate, as it is called, is directly

opposite the great gate of the palace. The walls of the outer or Chinese city are not so large as those of the Tartar city; their extent from the south-east corner of the latter to the south-west corner is 10 miles, being $2\frac{1}{4}$ miles from south to north, and 5 miles east to west. The entire circumference of the walls enclosing the two cities is 20 miles, leaving out the south wall of the Tartar city, which forms part of the enclosure of the Chinese city. The walls of the Tartar city enclose two other so-called cities, which have their distinct walls one within the other. One is the Hwang ching, Yellow, or Imperial city, from the walls being coloured yellow, and inside this is the Tse Kin ching, Forbidden City, which occupies the centre of the whole, and in which is the winter palace or residence of the Emperor. The whole city is traversed from north to south by two long and very broad streets, one on each side of the palace, and from east to west by two other large streets, the intermediate spaces being crossed by an infinite number of narrow lanes. Private houses and shops with the richly carved and gilded fronts peculiar to Peking, line the principal streets, and next to the houses is a broad pathway. The carriage-road in the middle is elevated about two feet, and between this and the pathway, especially in the busy parts and near the cross roads, are rows of wooden huts and shops, which give the streets a mean appearance. The streets are not paved; in dry weather, therefore, they are extremely dusty, and in wet weather almost impassable from the depth of mud.

The author next described the chief temples of the city and neighbourhood—the Observatory, Examination Hall, Buddhist Monasteries, and the Summer Palace. Leaving Peking by the Stone Road, the first object that is seen is the lake and its islands, on which stand several temples. A long marble bridge of eighteen arches connects one island with the road, and in the neighbourhood are several magnificent bronze figures of various animals. The Imperial hunting-ground, or Hae-tsze, as it is called, is three miles outside the south gate of the Chinese city. It is a tract of country enclosed by a wall fifty miles long. Several villages lie in the enclosure, and herds of oxen, horses, and flocks of sheep are pastured for the use of the court. The draught animals used in Peking are camels, horses, asses, and mules. The camels are all of the Bactrian variety, and during the hot months are sent into Mongolia.

This paper will be printed *in extenso* in the Journal, vol. xxxvi.

The PRESIDENT thanked the author very much for the description he had given of the topography of the Chinese capital, especially as it was so admirably illustrated by the maps and plans which he exhibited to the Meeting. The paper, however, seemed to him to be rather of an ethnological or archaeological interest than geographical. The author mentioned

that there was a great deal of coal in the hills north of Peking, and that Sir Frederic Bruce had imported coal there from England. If Sir Frederic had been as good a geologist as our ambassadors ought to be, he would not have made such a mistake as to import coal into the neighbourhood of Peking. Twenty or thirty years ago a Russian geologist and miner described in detail the coal-beds of the district, and stated that they were of the same quality as British coal. He saw present Captain Sherard Osborn, who had been to Peking, and had recently returned from Bombay to England; and a gallant officer, Colonel Walker, who had also been in service in the same country; he was sure that the Meeting would be glad to hear any observations they might have to make.

Captain SHERARD OSBORN said he was a visitor at Peking at the time Mr. Lockhart was there, and was a witness of the opportunities the author of the paper had of making himself personally acquainted, not only with the city and its very interesting people, but with the circumjacent districts. To him (Captain Osborn) Peking was doubly interesting, because he was a firm believer in the theory that when we reached the heart of that wonderful country we should put an end to all the bloodshed and trouble with which we had been afflicted for years. The great statesman who lately presided over the destinies of this country, and the great diplomatist whom he (Captain Osborn) had the honour of once conducting to the neighbourhood of Peking, always laid that down as the principle of our action in regard to China. That they were not mistaken he felt sure soon after his arrival there. To him, as a sailor, it was exceedingly interesting to see merchants and missionaries quietly wandering about the city, ... wants of the people, and ministering to them in mind and ... a single soldier to protect them, and guarded only by policemen. He hoped that Mr. Lockhart would some day publish a journal of his three years' residence in Peking; it would be one of the most valuable records we could have of the social condition of the people. He (Captain Osborn) agreed with the author of the paper that the whole of the belt of hills referred to was a great coal district. In the comparison of Indian and Chinese civilization nothing had struck him so much as the extraordinary progress the Chinese must have made in the two great essentials that marked the civilization of a people—namely, education, and intercommunication between different cities and districts. There was nothing more marvellous than the attention paid in China to communication, whether by canal or road. No one district is cut off from another for want of means of access. Though the English had been in India for 200 years, he had no hesitation in saying that China was 200 years a-head of India in respect to its communications. In education India was making great strides at the present day, and no doubt the Hindoo would soon pass the Chinaman; but the latter now had the advantage, as was obvious to any one who witnessed the preparations made at Peking to receive the elected scholar of all the scholarship of the 500,000,000 of China to be the prime minister of the country.

Colonel BEAUCHAMP WALKER enquired whether Mr. Lockhart could give any idea of the area of Peking and its population. He had formed an idea when in Peking that the population did not exceed 1,200,000. In the record of Macartney's mission it is put at about 3,000,000, but he (Colonel Walker) did not think that 3,000,000 people could have been crowded into Peking, comparing its size with that of London. All the houses were, with few exceptions, of only one storey; and the palaces in which the principal mandarins and the richer Chinese lived were built in courtyards occupying a large area.

Mr. LOCKHART stated that the entire area circumscribed by the walls shewn in the map was 20 English miles. As to the population he was of opinion

that from a million to a million and a half would be about correct. His own estimate was a million and a half.

Colonel WALKER said that was very near the estimate he had made. While he was in Peking the behaviour of the much maligned British soldier was so creditable that after the troops had been there about three weeks the people flocked into the city to an extent which might be called, not an *exodus* but an *inodus*; and it was afterwards said by the inhabitants, "You barbarians have been six weeks here, and no poor man has lost to the value of a farthing." Mr. Lockhart had adverted to the burning of the palace. That was simply a punishment to the emperor. It was his pet palace—the apple of his eye. The palace was burned without a single blow being inflicted on any Chinese, the only sufferer being the emperor himself, he being the instigator of the outrage which the burning of the palace was intended to avenge, as was proved by a letter under his own hand, which was discovered. Mr. Lockhart mentioned a very remarkable bell belonging to a large temple. He (Colonel Walker) was not sure that he was not the discoverer of that bell, having met with it in one of his morning rides. It was 9 feet high and 14 feet in circumference. The temple lay a short distance outside of Peking; and some idea of its size may be formed from the fact that it was intended to use it as the winter quarters of the whole of the British cavalry and infantry at Peking. He might mention, for the purpose of showing the state of Chinese civilization, that he found a printing-press with wood types in the city of Peking. No doubt China had been civilized for more than a thousand years, but their civilization was not of an advancing kind. The wall of Peking was 40 feet broad on the top, and allowed not only the passage of cavalry, but also of guns along it. Of all the dreary and filthy cities he had ever visited Peking was the dreariest and most filthy. The streets were very broad, but they were either knee-deep in mud or ankle-deep in dust, and the dust was very much of the same blue coal colour as that of Aldershot.

2. *Notes of Travel in the Peninsula of Sinai.* By the Rev. F. W. HOLLAND.

MR. HOLLAND visited the Peninsula of Sinai in 1861, and again in 1865, travelling, on the latter occasion, with two friends, on foot and without a dragoman, so that he was able to diverge from the beaten paths, and examine many places that had previously escaped notice. In 1865 he left Suez, on the 22nd of February, and encamped that evening at Ayun Musa, which the writer of the article on "the Wilderness of the Wandering," in Dr. Smith's 'Dictionary of the Bible,' has confounded with the wells of a similar name near Tor, and consequently tries in vain to reconcile the accounts of different travellers. Next day the party diverged from the usual track about eight miles south of Ayun Musa, and kept along the coast, where they found a considerable tract of land covered with grass, shrubs, and thickets of tamarisk. The most fertile portion is called Wady El Ahthi. On the 28th the party arrived at Wady Mughâra, where they were most hospitably received by Major McDonald, who had established himself there five years before, that he might re-open

and work the turquoise-mines of the ancient Egyptians. Mr. Holland counted, on the rocks around, no less than 32 hieroglyphic tablets, and concluded that the mines were probably worked by captives. On a hill overlooking them are the ruins of what was evidently a strong military position, from which run two walls across the intervening valley, so as to inclose the captive miners. Several excursions were afterwards made from Wady Feiran, one to the top of Mount Serbal, where Mr. Holland had an opportunity of verifying Burckhardt's statement as to the number of inscriptions on the rocks; and on another he discovered, on a high sugar-loaf-shaped mountain, some very interesting ruins. This mountain was accessible only on the southern side; here were the remains of steps cleverly built up of rough stones, many of them of large size, so as to form a sort of zigzag staircase. On reaching the summit he found that it was admirably fortified. The approach was protected by several cross walls, with narrow doorways, and was made to wind in such a manner as to expose an attacking party to the darts of the besieged. Near the centre were the ruins of four square chambers, each measuring nearly 14 by 20 feet, the walls of which were 2 feet in thickness; and remains of other chambers and cisterns were observed. From amongst a quantity of broken pottery Mr. Holland picked up a small piece with three letters, closely resembling Himyaritic, inscribed upon it. The name of the Mount is Jebel Solar. On another day, while at Feiran, he discovered the track of an ancient road, and traced it for some miles across a narrow pass between the mountains of Afreet and Serbal, and down Wady Baksáah. On questioning the Arabs, he found that they knew two kinds of roads in the peninsula,—the "Camel Road," and the "Mountain Road,"—the latter of which they all described as having been made by the ancients. Mr. Holland's curiosity being excited, he spent a whole week with an Arab guide in tracing these ancient roads. The road which crossed the mountains to the south of Jebel Solar was called by his guide "Sicca Solar;" and another, which apparently led to the top of Jebel Serbal, he called "Sicca Lahm." In some places these roads showed considerable engineering skill in the way in which they are carried along the precipitous mountain side.

At Wady Mughâra, and at Surabit el Khadim, Mr. Holland could find no traces of copper-mines, and believed that turquoises were the only objects of the miners, who were most probably Egyptians; worked flints were found at both places. Jebel Umshaumer had long been supposed to be the highest mountain in the peninsula, but Mr. Holland's aneroid proved Jebel Catherine to be higher by 33 feet; the height of the former being 8030 feet, that of the latter

8063 feet. The author also gave the result of his investigation of the various routes supposed to have been taken by the Israelites from the Egyptian side of the Red Sea to Jebel Musa, and gave in detail the grounds on which he had come to a slightly different opinion on this subject from previous writers. With regard to Sinaitic inscriptions, Mr. Holland paid especial attention to them, and found their extent to have been much underrated. He believed that a thorough investigation of them would give a key to the character and history of the writers. His own observations led him to the conclusion that they were not the work of mere casual pilgrims or travellers, but of a settled people who lived in the central granitic district, especially in the neighbourhood of Jebel Serbal, and who made the "mountain roads."

The PRESIDENT said he was sure the Meeting had heard with great interest Mr. Holland's description of the Peninsula, for it was the result of much personal exertion, including long journeys on foot, made under considerable privations. Having taken a great interest in the exploration of Palestine and the work of the Palestine Fund, he was happy to find that the author had concluded his very remarkable paper by a pertinent allusion to that subject. He was also very glad to observe that the Archbishop of York was present, as his Grace had taken the lead in promoting the exploration of Palestine.

The ARCHBISHOP OF YORK had listened to the paper with great interest, as he was sure all present must have done. He did not think that the period had been reached when inferences might safely be drawn on many points connected with ancient and sacred history. It was commonly assumed that Palestine was a well-known country, but he believed that assumption to be entirely contrary to the fact. Palestine and the Peninsula of Sinai had not been as yet thoroughly observed and explored, although they had been traversed by one traveller after another upon the old system. We still wanted facts more than inferences. He would mention the name of Mr. Tristram as another observer in the same walk who had lately put forth a most valuable contribution on the subject of Palestine. It was from such men as Mr. Holland and Mr. Tristram that we must learn much before we could safely trust ourselves to make inferences of the character which some had made—inferences, let him say, which it was easier to make than facts were easy to observe. He hoped it would be remembered, after the allusions which had been made to the subject, that the Palestine Exploration Fund was a sort of younger sister of the Geographical Society, its business being to send persons to collect facts to enable us by-and-by to make sounder deductions and better inferences, and thus avoid the confused ideas which now disfigured our discussions on the subject of Palestine.

Eleventh Meeting, 14th May, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in
the Chair.

ELECTIONS.—*George W. Bacon, Esq.; the Hon. George Campbell;
William Gillespie, Esq.; Lieut. Brownlow Villiers Layard; Captain John*

F. A. M'Nair, R.A.; John George Miles, Esq.; Captain Francis G. S. Parker, F.G.S.; Edward A. Prinsep, Esq.; Robert Pharazyn, Esq.; Adam Scott, Esq.; William Scott, Esq.; Walter T. Sendall, Esq.; John Edwin H. Skinner, Esq.; Nicholas Kirkby Torre, Esq.; Sydney Walker, Esq.; Richard Worthington, Esq.

ACCESSIONS TO THE LIBRARY SINCE THE LAST MEETING, 23RD APRIL, 1866.—'The Anthropology of the New World,' by W. Bollaert, Esq. Presented by the Author. 'Cuestion de limites entre el Ecuador i el Peru,' por P. Mosecarfo. Presented by J. Power, Esq. 'Das Ausland. — Uberschau der neuesten Forschungen auf dem Gebiete der Natur-, Erd-, und Völkerkunde.' 38^e Jahrgang, 1865. 'Reisen durch Süd Amerika.' Vol. I. Von J. J. von Tschudi. Both added to the Library by purchase. Continuations of Periodicals, Transactions, &c., of the different Societies.

ACCESSIONS TO MAP-ROOM SINCE THE LAST MEETING.—India; Map of mountain-ranges adjacent to the Punjab, showing Forests. Presented by C. R. Markham, Esq. Atlas of the Colony of Queensland, Australia, by the Surveyor-General. Presented by the Colonial Office, through T. Cardwell, Esq. British Burmah: Pegu Division. Presented by the India Office, through J. Walker, Esq., Hydrographer. Two Oil-paintings of the Victoria Falls, Zambesi River. Presented by the artist, T. Baines, Esq. Map of India, by J. Walker, Esq., on 6 sheets. Purchased. Map of Asia-Minor, by Kiepert, on 2 sheets. Purchased. Abyssinia: MS. by Consul Plowden. Presented by the Royal Geographical Society of Paris. Indian Atlas; 14 sheets of the Great Trigonometrical Survey of India. Presented by the India Office, through J. Walker, Esq., Hydrographer. Ditto: the North-Eastern Frontier of Bengal, by Lieut.-Colonel Thuillier, Surveyor-General. By the India Office. Map of Burma, on 2 sheets, by Colonel Yule. Presented by Mr. Arrowsmith.

Previous to the reading of the papers the PRESIDENT announced that a despatch had been received by the Foreign Office from the Political Resident at Aden, and communicated to the Society, relative to the supposed existence of survivors of the wreck of the *St. Abbs* in a state of captivity amongst the Somālis of East Africa, and stating that the agent (Colonel Merewether) had commissioned a very intelligent Somālī, interpreter of the police court at Aden, who was going on leave to his home, to send a trustworthy person to the country where the Europeans are said to be living, and to bring back certain intelligence of their being there or not. The contents of this despatch he was sure would be satisfactory to the meeting, as it showed that every endeavour was being made to ascertain the facts of this case, which had been so ably brought before the Society during this session by Colonel Rigby.

The PRESIDENT then stated that the first communication to be laid before the Society this evening was one by Captain Montgomerie, respecting the

elevated region which separates our Indian possessions from Chinese Turkestan. Captain Montgomerie had already received the Society's Royal Medal for his adventurous explorations and his admirable trigonometrical observations, in these difficult mountainous countries on the extreme north of our Indian empire. The communication contained the result not only of the author's own observations, but also of those made by a well-informed Moonshee, an inhabitant of the Punjab, who was instructed by the author for the purpose of extending an outline survey to Yarkund.

1. *On the Geographical Position of Yarkund and other places in Central Asia.* By CAPTAIN T. G. MONTGOMERIE, R.E., Gold Medallist R.G.S.

THE author stated, that whilst employed as astronomical assistant of the Great Trigonometrical Survey of India, in surveying Kashmir, Little Thibet, and the neighbouring provinces, he always kept in view the possibility of making a reconnaissance of the countries lying to the north of the Mustakh and Karakorum ranges. He at length succeeded in finding an intelligent Moonshee, named Mahomed-i-Hameed, willing to run the risk of carrying instruments to Yarkund, in Eastern Turkestan, to fix its position, besides surveying the route thither from the trigonometrical stations in Ladak. He was trained by Captain Montgomerie to take observations for latitude with a small sextant, to record the temperature of the air, and of boiling water, and to make a rough skeleton route-survey from point to point. He started in the summer of 1863, and after spending the winter in Yarkund, making his observations secretly by night, returned over the mountain passes in the following spring; his return being hastened by the threats of the Chinese authorities, whose suspicions were aroused by his proceedings. Unfortunately, the Moonshee died when within a short distance of one of the surveying stations, but his papers were all preserved and given up to Captain Montgomerie. The latitude of Yarkund proved to be $38^{\circ} 19' 46''$, and the longitude, as deduced from his route survey, $77^{\circ} 30' \text{ E.}$; the altitude was 4000 feet above the sea-level. The march across the mountains, to the watershed dividing India from Turkestan, occupied fifty-one days, a result which gives a grand idea of the enormous scale of the Himalayan ranges. The road for twenty-five days was over country never lower than 15,000 feet, and for forty-five days not lower than 9000. The distance, in a straight line from Jummoo to Yarkund, is 430 miles, so that the mountains are at least 400 miles across at their smallest breadth. The winter at Yarkund was very severe, the thermometer, early in January, falling nearly to zero, and from the 19th to the 26th January snow fell; the sky, however, was

generally clear. The Moonshee was much struck with the fertility of the surrounding country. Although the province is ruled by a Chinese official, and the city garrisoned by Chinese troops, the mass of the population is Mahomedan, and ruled in ordinary matters by its own Governor subordinate to the Chinese.

Captain Montgomerie exhibited a large and characteristic sketch of the Mashabrum Peak, the most conspicuous mountain in the Mustakh and Karakorum range. The peak is visible between two large glaciers, and from near Kapaloo a clear rise of about 18,000 feet is seen at one glance,—a most magnificent sight; Kapaloo being about 8000 feet above the sea, and the peak itself 26,000 feet. Behind the Mashabrum Peak lies the peak K_2 , which rises to 28,257 feet above the sea, being the highest in the range and the second highest in the world. K_2 is surrounded on all sides by very lofty peaks, and is consequently never seen to great advantage.

Captain Montgomerie also exhibited a sketch of a large portion of the Mustakh Range, taken from above the desolate plains of Weosai, at an elevation of about 16,000 feet. In this sketch, Captain Montgomerie delineated a number of other peaks east and west of Skardo, the capital of Little Thibet. In a third sketch, drawn by Lieut. Carter, R.E., the whole of the Mustakh Range to the west of Captain Montgomerie's sketch was shown; the most westerly snowy peak being still 19,000 feet above the sea, and the range apparently showing no signs of decreasing altitude. In all, the sketches exhibited showed about 200 miles of the great Mustakh and Karakorum range.

The paper will be printed in *extenso* in the Journal, vol. xxxvi.

The PRESIDENT commended the author for having conducted the arduous survey of so large a portion of the North-western Provinces of India with such perfect success, and in addition having had the sagacity to instruct a native Mahomedan to carry an outline survey over regions still further north, where it was not possible for our own explorers to penetrate. As no European traveller had ever visited Yarkund, the importance of the very highest importance to geographers. The President also added, that the meeting being honoured with the presence of the Rajah of Johore, a territory lying north of Singapore, he could not let the occasion pass without stating that his Highness had expressed to him how much it had gratified him to find, on his arrival in this country, that Englishmen were taking such an intense interest in everything connected with Asia and his own country. His Highness stated that he was doing all he could towards the improvement of his country by making a road of a considerable length, and by establishing railroads throughout his territory.

SIR ANDREW WAUGH (late Surveyor-General of India) said he could quite corroborate what the President had said regarding the extreme value of the paper. It was a great gratification to him to find a pupil of his own distinguishing himself for his geologic operations in the Himalayas and geographical discoveries, and that the Council of the Society had conferred upon

him, in the previous year, one of their gold medals. Captain Montgomerie had now presented to the Society a paper of a different nature, indeed, from the detailed account of the work which he had carried on with so much success, but it was an analysis of the geographical materials, he had imported all the care and in the Great Trigonometrical Survey of India. That great work was carried on with a degree of accuracy which could be indicated by fractions of an inch. On this account the Moonshee's expedition was correctly fixed, and as it was chiefly meridional, the estimates of longitude were to be relied on, for any error in the length of the journey would not make any great difference in the result. He therefore believed that the longitude of Yarkand had now been determined better than it had ever before been. There might be some wonder felt that there was so much uncertainty about places situated at so short a distance from our Indian frontier. The reason was, that the intermediate region was mountainous, the climate excessively severe, and the people were fanatics, amongst whom it was very difficult to travel. The Government of India would not allow any enterprising officers to explore the country, however much they desired to do so. The plan adopted by the author was the only one by which the exploration, under existing political conditions, could be made. The history given in the paper respecting Mahomed-i-Hameed, the Moonshee, was very interesting, and his untimely fate was most touching. He (Sir Andrew) was ten years ago, when he was organising the survey on which Captain Montgomerie had been employed, they discussed the awful difficulties there were in the way. There never had been astronomical instruments carried up to such enormous heights. They had to cross two ranges of snowy mountains, the peaks of which had never been trodden by the foot of man or even any animal, and the natives in charge of the signals had to live on the mountains for several days together. He must do the natives the justice to say, that they well withstood the cold, and endeavoured to promote the success of the survey. The operations were carried on during the Indian mutiny, but none of the natives engaged in the exploring party rebelled, although the mountains were made the refuge of sepoys, who were pursued by the British troops. Besides the physical obstacles, Captain Montgomerie had to encounter political difficulties in Kashmir and Ladak of a very peculiar kind. He was surveying the country of a foreign potentate, but to his other merits he added a talent for diplomacy, and made himself so agreeable to the Court that he made friends there; and thus, instead of being obstructed, the party received a great deal of support from the Maharajah, and the Court remained friendly all through the period of the mutiny.

Sir HENRY RAWLINSON believed that sufficient attention had not been paid by geographers to the countries which the paper related to. Many persons present might imagine that the survey in which Captain Montgomerie had been engaged was a matter of no especial difficulty, being in our own possessions: but such was not the case. In reality the whole of this magnificent survey had been conducted in provinces which belonged to independent potentates, and this struck him as a most remarkable feature. The diplomacy which enabled the officer charged with the mission to make such a careful and elaborate geodetic survey in a foreign country, was very remarkable. The territory beyond our northern frontier in India was one of the greatest possible interest. It was in reality the debatable ground between India and Russia, and must naturally become more and more so year by year as we went on towards our future destiny. It was, through Sir Andrew Waugh and Captain Montgomerie, carried a careful survey from our own frontier up to the Karakorum range, and even beyond; while the Russians had come down to the other great chain, the Thian Shan, below

Lake Issyk-kul: there was now, therefore, only a small strip of from 250 to 300 miles across, between the Thian Shan and Yarkund, remaining to be laid down. When that was done, Central Asia would be brought into the category of known geography. At a former meeting he (Sir Henry) had followed the steps of an anonymous German traveller, who claimed to have explored a part of the region described by Captain Montgomerie. The German traveller alleged that he started from Srinagur, the capital of Kashmir, and reached Kashgar in 24 days. He (Sir Henry Rawlinson) observed that Captain Montgomerie's Moonshee took 66 days to march from Jummoo, a place near Srinagur, to Yarkund, and that number of days was in line with the period which he (Sir Henry) contended would be the period which the German stated he accomplished in 24 days. Captain Montgomerie's observations were thus a verification of the exceptions which he (Sir Henry) had taken to the narrative of the supposed German traveller. Very much still remained to be done with regard to the geography of the region; but he thought that the impetus which had now been given to the inquiry would increase, and would produce important results. The plan which had been initiated by Capt. Montgomerie, of employing natives in these preliminary surveys or reconnaissances, was certainly a most desirable one. They might not be able to use delicate scientific instruments with great precision, but they were quite competent for all the purposes of a reconnaissance survey, and they had facilities not possessed by Europeans for penetrating into distant and difficult regions. The Council of the Society had that day performed a very graceful act in awarding, subject to the approval of the General Meeting, a watch of the value of 25 guineas to one of these native explorers, whose journey across the Pamir steppes, from Kashgar to Kokhan, he (Sir Henry Rawlinson) had recently communicated to the Society. If Captain Montgomerie's Moonshee had lived he would have been a very deserving recipient of such recognition. It was by acts such as this that the Society most effectually discharged the functions which the present state of geographical science required of it. It was its duty to extend a helping hand wherever Europeans or natives were ready to make explorations, so that through their means a mass of information might be collected which Mr. Arrowsmith and the practical men of the day would be able to reduce into a form of direct geographical value.

2. *Rough Notes of a Visit to Daba, in Thibet, in August, 1865.* By Captain ADRIAN BENNETT, Royal Fusiliers.

BEING unsuccessful in the pursuit of the game of Thibet, viz., *ovis ammon*, yâk, and burrel, and being disgusted with the small bag I had made during the fortnight I had been in the country, I determined to go and see Daba, the capital of that part of Thibet in which I was, viz., that portion adjoining the province of British Gurhwal, and which is the only part of Thibet open to Europeans, and then under the surveillance of a Tartar guard furnished by the Zumpun, or headman, of Daba, a Chinese official. I was curious to see a place which was so studiously shut out from European eyes: so much so, that since the year 1810 there is no record of any European ever having been to the place; more especially as my shikary could or would not give me any information as to what it was like, but steadily persisted in saying that no sahib had ever

been there; although, when asked why, he could assign no reason for their not going, unless it was that there was no game in that direction. In 1810, Moorcroft, and another traveller whose name I do not now recollect, penetrated in disguise through Daba to Gartok, which is about 100 miles beyond. Moorcroft was afterwards murdered in Bokhara.

I was at Kyanggyung at the time I made up my mind, and the next day pitched my camp at Gilteerung, a few miles nearer, giving out that, as I had entered Thibet by the Chor Hoti Ghaut, I should work round to my left and return by the Niti Ghaut; and not to frighten the jooboo-drivers, my followers, who were all Bhootas, or inhabitants of the Snow Villages in British Gurhwal and who have the monopoly of trade with Thibet, I went out daily shikaring, sometimes shooting a snow-pheasant, but oftener not. I encamped successively at Shako, Shugla, Tazang, and Surkiya: this last is on the high road from Gurhwal over the Niti Ghaut to Daba, and, being a much better road, is always used by the Bhootas for their droves of laden sheep, goats, and joobos. I had now left the hilly country which surrounds the high table-land, and intended to move in the direction of the Sutlej, which I could plainly see from the tops of the hills I had quitted, and therefore pitched my camp, on the 30th July, at Changluor; the road being across an arid plain, where not a blade of grass could be seen, except in the two ravines or nullahs which intersect the road. The road itself was only a number of footpaths, running in the same direction and worn by the feet of the different droves continually passing and repassing, and scarcely traceable on the face of the vast plain except by the absence of stones along the little lines running into and out of each other. The road is marked by heaps of stones placed at certain intervals, perhaps half a mile or a mile apart; otherwise on such a plain it would be easy to miss. I saw numbers of kyang, or wild horses, grazing about the plain as I went along. Marmots are to be found in vast numbers all over the country, and grow to an immense size: I shot one weighing upwards of 40 lbs. On the 31st I arrived at Dombra, and on the 1st of August I encamped at Daba. On the way I had some little difficulty in passing, for a number of Tartars, mounted on their small wiry ponies, came out to meet me when about a mile from their city; but I told them I did not intend to be stopped and was well prepared for any eventualities. They thought better of it, and, after a futile endeavour to get me to sit on a carpet spread for the purpose, they mounted and followed some little distance in rear. I had previously read Dunlop's book, 'Hunting in the Himalayas,' and took care not to waste time by

sitting down and arguing the point with them, but determined to have my own way and proceeded accordingly. Again, when within some 300 yards of the city, they all got in front and salaamed; but I told them I did not wish to enter the town, but just to go up to the foot of the walls of the Llama's fort, so that they might not say a sahib had never been there, and they allowed me to proceed without further molestation, although evidently disgusted, for they all galloped off to their respective places with loud cries,—the Llamas to their lofty dwellings and the townspeople to the town below, where the news soon spread that a sahib had come; for a numerous and motley crowd came pouring out of the gateway towards where I had sat down,—among them numbers of Bhooteas, inhabitants of Niti, Bourpa, Gurmsali, and Pharká, who have places in the city for trading purposes. Through the Pudhan, or headman, of Gurmsali, who was in the crowd, I told them I had no object but curiosity in coming among them; and asked why they had such an objection to see sahibs, as in all the neighbouring countries and states sahibs were always received and treated with the greatest respect? They replied, it was the order of their superiors (Chinese); for themselves, they were glad to see me, and should not care how many sahibs came. I found the Zumpun, or chief man, had gone to Gartok on a visit to his immediate superior, who resides there. When I first saw Daba it was about two miles off. I found a very large ravine opening from the range of hills which bounded the plain on the west; this ravine took a turn to the north just as the road cut it, and the road led down the ravine, which was about 100 feet below; a small stream of water ran down the centre; the ravine was about half a mile wide. Just as I arrived at the edge of the ravine, one of the jooboo-drivers said, "Sahib, there's Daba!" and looking towards the direction he pointed, which was down the ravine, I saw something red, which I took to be a large flag, but, as I approached nearer, found it was the Llama's place, which was all stained with a blood-red colour. It looked a grand and imposing city, towers and battlements all the way along; but I saw, on a nearer approach, that these towers and pinnacles were natural, and had been hollowed by the people, who lived in the chambers, one above the other, to a great height. The ground had evidently during past ages been worn by the action of water into the queer tower-like buildings, and had then been hollowed and inhabited. The ground was like very soft sandstone, and full of little pebbles. The whole side, which appeared to go back about half a mile, was thus burrowed; the highest part was the Llama's, and the lower the town. There was only one narrow

entrance or gateway into the city, cliffs on each side; but from where I stood I could see into it. There appeared narrow and crooked streets, and some of the lower parts of the cliffs which had been hollowed appeared like shops and were whitewashed. There was not a brick or stone in the place, and all the dwellings had been dug from below. Gaps had been cut in the outer walls for windows, but there was no woodwork: indeed, there is no wood in the country except brushwood. I ascertained that the Bhooteas did not go further than this place; here they deposited their flour, rice, &c., and receive in exchange salt, borax, and pushea. They have no coinage or weights; their trade is all carried on by barter. The rate of exchange was two measures of salt for three of flour or rice; the salt is very bad and dirty, but, even so, is invaluable to the Bhooteas and villagers who dwell on the slopes of the Himalayas as far as Almorah. The Thibetans employ their own cattle to bring the salt, &c., from the interior of the country. After I returned to my tent I was visited by a deputation of the chief men, who brought me a present of four large wild-goose eggs; and they received in return a piece of honeydew tobacco, with which they were greatly pleased, as they never get anything to smoke but the wretched stuff brought them by the Bhooteas. They informed me the eggs were brought a long way, from the salt lakes, where the birds congregate in immense numbers. They also gave me to understand that now a sahib had come, there would be no objection to others coming at a future time, providing they went no further into their country. I never saw such a barren country: they cannot grow anything in it. It freezes every night throughout the year, and the wind is always blowing—the coldest I ever experienced. I was surprised at the almost total absence of snow; for, excepting on the highest ranges of hills, there was none to be seen. Farther north in Lahoul, Spiti, and Chini, where I had travelled, and at an elevation of only 12,000 or 13,000 feet, the snow lies for nine months in the year; while here, where the table-land is over 16,000 feet high, there was none. And again, in crossing the Padree Pass, near Budrawar, which is only 10,000 feet, and the Rotung Pass, between Kooloo and Lahoul, which is 13,000 feet, I experienced great difficulty from the snow, and where for many miles it lies all the year round: while here, in crossing the Chor Hoti Pass, 18,300, and the Niti Pass, 16,800 feet high, there was scarcely any snow to be seen. Daba is only nine or ten miles from the banks of the Sutlej, which is here crossed by an iron bridge, and, beyond, a plain of about sixty miles separates the Sutlej from the Indus. Both rivers take their rise here: the former from some lakes, and the latter from the hills

beyond. I wanted to cross the Suttlej, but was informed there was neither bridge nor ferry, but that after three months a ferry would be established. This was all false; for I afterwards met an officer at Nynee Tal who is employed in the survey, and who informed me that, on one occasion, he and his party had crossed the Suttlej by stealth over the iron bridge, but were obliged to return in consequence of the serious illness of a brother officer. I left the next day, according to agreement, and returned through the Niti Ghaut by the western hills, shooting on my way. I saw there the real pintailed grouse, feathered to the toes and with two long feathers in the tail, and secured some as specimens; I also picked up numerous fossils and shells. I had collected ferns along the hills from Simla to Niti, and found some—the *Asplenium alternans*—at Niti, at an elevation of 11,000 or 12,000 feet. I arrived at Niti, after a stay of one month in Thibet.

3. *The Western Shores of Volcano Bay, Yesso.* By Commander C. S. FORBES, R.N., F.R.G.S.

THE author left Hakodadi on the 30th of August, 1865, for the purpose of exploring the western shores of Volcano Bay, the expedition consisting of three Europeans, one Chinese, and five Japanese, all well mounted. The ascent of the high mountainous land commenced at a distance of five miles from the town. It is a wild country of forest, uninhabited, except by a few charcoal-burners. The first village they reached on the shores of the bay was named Osarcibé; but the shores are studded with villages and hamlets inhabited by fishermen, who were then employed in gathering kelp, which is exported to China as an article of food: the fishermen are a vigorous and industrious race, and manage their boats with great dexterity. On Sept. 1, the party started in a boat for Cape Yesso, to examine the volcano of Ushiuruyama, the highest in the neighbourhood, namely, about 1900 feet. The Japanese Government has sulphur-works on the slopes of the mountain. The bottom of the crater was found to be about half a mile in width north to south, and three-quarters of a mile in length from east to west; steam was ascending in many places, and several geysers were roaring in different directions. Many of the hot-springs are intermittent; and none of them approximate to the perfection of form and eruption which characterises some of the larger geysers in Iceland. On Sept. 2, the party saw a settlement of Ainos, the aborigines of Yesso. They came out at once to welcome their visitors. Their mode of salutation is somewhat peculiar: they first rub their

hands together, then raise them slowly to the forehead, ending by stroking their long black beards. Though their stature is moderate, they are well and stongly built, and their physiognomy is decidedly good, approximating much more to the Caucasian than to the Mongolian type. Their complexion is fair, though sunburnt, and they have an exuberant development of hair on head and body. Were it not for their soft black eyes, they would have a decidedly savage appearance. The women tatoo their lips. Their huts were of the poorest Japanese style, with little or no furniture save cooking-utensils and implements for fishing and the chase. There was no attempt at cultivation in the vicinity. Their costume was a simple flowing robe of skin or cotton. The present number of the Aino population is scarcely 50,000; and they live for the most part in the interior of Yesso in societies of from ten to twenty families, governed by their own hereditary chiefs. After leaving the Ainos, the party traversed the great pumice waste, which extends for many miles round the eastern slopes of the volcano Komanartaki. The same evening they reached Sarawa; on the following day they followed the coast as far as Mori, and thence struck inland to Konomar, a tea-house on the shores of a lake on the southern side of Komanartaki, which mountain they ascended on the following day: this volcano was in eruption in 1855 and 1796. Returning to Hakodadi, Commander Forbes made, a few days afterwards, a second excursion along the shores of Volcano Bay, reaching Yamacushinai, he saw the volcano of Endermo, with its four vents in a state of activity; and further, towards the interior, three other mountains which appeared to be volcanic; one of them is about 7000 feet high. The interior of Yesso is very little known even to the Japanese themselves.

Commander Forbes' paper will be printed in the Journal, vol. xxxvi.

The President stated that Commander Forbes had brought from Yesso the skull of an *Aino*, the aboriginal race of the island, which was understood to be the first specimen of the kind brought to England. There was now present an eminent comparative anatomist, Professor Huxley, who had particularly occupied himself with a comparison of the skulls of different branches of the human race. The Society would be most happy to hear his opinion as to the skull in question.

Professor HUXLEY said that in the few remarks he had to offer he should bear in mind that this was a Geographical Society, and not an Ethnological or Zoological Society. Commander Forbes had placed in his hands the skull of one of the inhabitants of the island. They were a people who had attracted the attention of ethnologists from the time of Desmoulins, who devoted a particular section of his work to an account of them, illustrated by figures copied from a Japanese work. All who had seen the Ainos, as they were called, had agreed in stating that they were a comparatively fair people,

with features unlike those of the adjacent tribes, whether Japanese or Chinese, and furthermore that they possessed the very remarkable peculiarity of being clothed from head to foot in a singularly strong felt of hair. This was a particularly remarkable circumstance, because the island of Yesso lay in the immediate vicinity of Eastern Asia which was inhabited by people, one of whose most notable distinctions was that they were, perhaps, less provided with hair upon the body than any other race in the world, although the hair upon their heads, as in the case of the Mongolians and Chinese, commonly attained a considerable length. He thought that upon that and upon some other grounds many persons were disposed to think that the accounts which had been given of the Ainos, or hairy people, were exaggerated, and that it would turn out upon further enquiry that they were a people closely allied to the Japanese and Mongolian populations of Eastern Asia. Under these circumstances, in the mind of every scientific ethnologist a particular interest attached to the careful examination of their skulls. He believed that the skull brought home by Commander Forbes was the first specimen of the kind that had reached Europe, and therefore he had examined it with very considerable interest, which was heightened by the fact that some two or three years ago he had had the rare opportunity of examining and comparing several Japanese skulls. If he stated first what kind of impression the Japanese skulls awakened in his mind, the meeting would be able, perhaps, better to appreciate the particular interest which attached to the Aino skull. He had examined three Japanese skulls, the authenticity of which was well certified. The two most characteristic were unlike any Chinese skulls, and were still more unlike Mongolian skulls of Eastern Asia. They were remarkably long skulls, a formation totally unlike those of the predominant Mongolic stocks of Eastern Asia and China; and they had many other characteristics so peculiar that, as he remarked at the time to the Ethnological Society, he could find no parallel to these Japanese crania anywhere nearer Japan than the northern coasts of North America, and the eastern parts of northern Asia, where we meet with the Esquimaux, a people distinguished by the length of their skulls, and the Tchuktohi, who are said to resemble them. Perhaps the Tunguses must be included in the same category. Neither in Central Eastern Asia nor Siam were there found any skulls similar to these. If, again, we turned to Western America, we found no similarity in cranial formation. The people there were broad-headed; and thus to find a parallel we were confined to certain American and Asiatic tribes, who inhabited the region immediately surrounding the Arctic Circle. The long line of the Aleutian Islands, as far as we know, is peopled by a Mongolian race, whose skulls are as unlike these long skulls as anything could be. It was known that the Ainos were at one time much more numerous than they are at present, and that they inhabited a large part of the island of Nippon. The entire extirpation of the aboriginal inhabitants of a country by invaders was an excessively rare thing, and there was every reason to believe that the encroaching Japanese population, as it subjugated, absorbed, and exterminated the Aino population. Thus no doubt a very large proportion of the Japanese became mixed with that of the proper Japanese population. Whether they were so, or whether it were not, it was at any rate a remarkable fact that this particular Aino skull was one which exaggerated the Japanese type. It was a long skull, unlike that of all the adjacent peoples of Asia, except perhaps the Tunguses; and it formed a sort of intermediate link between the Chinese skull and the remarkably elongated skull of the Esquimaux. Thus it appeared possible, supposing—which he assumed for the present, having no better evidence—that this particular Aino skull was a type of all Aino skulls, that the feature which differentiated the Japanese from the majority of the nations which lie to the west and south of them might be derived from their

admixture with the Ainos. Where the Ainos themselves came from, and what were their relations to other people would be a very large question, into which he could not for one moment attempt to enter at present. He had made these remarks simply with the view of pointing out to the Society how very much we were indebted to _____, who had at great personal expense and trouble procured this valuable relic.

The PRESIDENT said that the meeting would be much interested to hear from Commander Forbes whether there were any historic records of former volcanic eruptions in Yesso, and if he had any information as to the extent to which in ancient times the Japanese had communication with the outer world.

Commander FORBES stated that our information regarding events in Japanese history would soon be much extended, as Europeans have lately had access to books and manuscripts which will throw great light on the subject. In the Japanese Archipelago there are at least twenty-seven active volcanoes, but in Yesso only eight are known to the Japanese themselves, five of which are in Yesso, and four on the islands near its shores. Nothing could be known of the eruptions on this island prior to the fourteenth century, at which date its occupation was first accomplished by the Japanese; but concerning the volcanic history of Nippon, Sikok, and Kiusiu, we may expect to have the most exact information, as the Japanese annals have been kept with great minuteness; the history of Fusi-yama, for instance, is recorded for the last 2051 years. With regard to the intercourse of the Japanese with the outer world we have abundant proofs of this nation being the Norsemen of the far east prior to the year 1638, when they were forbidden by law to leave their country and the rig of the _____ Before that time they roamed over the whole _____ adjacent islands, and were renowned throughout the neighbouring countries, not only for their maraudings, but for their administrative capacity. In the fifteenth century Japanese traded to Acapulco in Mexico, and many of them established themselves there in the time of the Spaniards. However extraordinary the statement might seem, he had no doubt that the MSS. recently obtained in Japan by his friend the Rev. Mr. Brown, an American missionary, would tend to prove the fact that the Chinese and Japanese visited Mexico centuries before the time of Columbus. Within the last few years, a Chinese book has been found and translated, which was written in A.D. 499, giving an account of the travels of five Buddhist priests, who in A.D. 458 visited Mexico, by them termed Fou-sang, and gave a minute account of the country and its inhabitants. His own experience in Mexico and other parts of America led him irresistibly to the belief that the Aztec and Inca civilizations were imported from Eastern Asia. Concerning the Japanese, this much has come to light,—that, at a very early date, they explored the shores of Kamtschatka and the north-western shores of America. Between the shores of Japan and Vancouver's Island there is an ocean current running at the rate of thirty miles a day, whilst in the Pacific there is a fair trade wind for a return voyage to the west. It is not long since that a Japanese junk was carried across the Pacific by this current, and three survivors of its original crew landed at the mouth of the Columbia River and were sent back to Japan. Whether his surmises relative to Japanese civilization in America were correct or not, the old spirit of enterprise in the Japanese is reviving, and their Government will be forced to rescind the law which forbids its people and their vessels to leave the country. Already one Japanese prince has abandoned the antiquated junk and has seventeen steamers employed in the trade of his province, in none of which, since the day they passed into his hands, has a single European been employed on board, Japanese engineers and Japanese sailors being found thoroughly competent to work them.

SIR GEORGE BACK said that he perfectly well remembered the drifting of the junk referred to, on the shores of Western America near the mouth of the Columbia River, while he was on one of his expeditions to Arctic America. He communicated the fact to his Majesty William IV. in the autumn of 1835.

ADDITIONAL NOTICE.

(Printed by order of Council.)

On the Site of Ophir.

The following extract from the 'Cape and Natal News,' of August 2nd, 1864, respecting an alleged discovery in Southern Africa, was published in a 'Notice to Correspondents and Queries,' by Mr. George Thompson, who believes it probable that the ruins described mark the site of Ophir.]

"We have heard that the Rev. J. L. Dohne, near Durban, has been informed by a German missionary of the discovery of the ruins of ancient cities on the southern part of Africa; and we presume the following account, from the 'Eastern Province Herald,' relates to them:—

"Some time ago, a party of travellers, some of whom were connected with the Berlin mission, went on a tour of exploration in the country between the Limpopo and the Zambezi; and here is what they report:—The country from where we started on our tour of discovery is situated in the Leydenburg district, the free territories of the Bafedis (a Basuto chief) Sekukune, the son of Sekwaei, where there has been a mission station since the year 1864. We started on our expedition with 10 trustworthy and well-armed Bafedis, and 5 carriers for our little luggage, and took our route north-east to the Limpopo river; two 'Knoapnenzen' served us as conductors to take us to the ruins of Bunjaai, of which we had heard long ago from some eye-witnesses, who were willing, but only required the permission of their chief Serabane, who was on friendly terms with the natives living near the ruins. Serabane at first positively refused, as he said it would cost his and our lives if he should take us to the ruins, but at last he agreed to let us and his people go there, but on our own risk. One of the conductors had been born and brought up in the neighbourhood of the ruins, and only latterly went to Serabane. On our journey we heard some very interesting particulars about them. They were continually frightened to take us any further, but at last agreed to take us to the neighbourhood of the ruins, and then leave us to our own fate to find our own way. Why Serabane should refuse and his own people be so frightened, I am at a loss to report; at any rate the Bunjaai must be a sacred place, as it is forbidden by punishment of death to take any white man there, kill any game, or even damage any of the trees or shrubs there. Respecting the ruins themselves so much is certain, that there are two places on which Egyptian ruins are situated. The smaller place is situated south of the Limpopo, called Bembani. There even have been waterworks—the water flowing out of an animal's head cut out of stone. Many stories are connected with this holy place; but more important is the real Bunjaai, situated on the Salis River. This town must have been 'several hours' in circumference. There are one or more pyramids, also Sphynxes, parts of grand buildings, as well as many marble tables full of hieroglyphics, and for the history of Africa certainly very valu-

able. There is one underground passage, about half a mile long, full of such tablets with hieroglyphics. This passage has many saloons on each side. The entrance to the one is done very artfully: after pushing a large stone plate aside, you enter into a large saloon. For what purpose this place must have served we could not ascertain, but very likely it has been their burial-ground. Although we should have liked to see these ruins, we found it impossible for us to go any further this time—and only two days' journey from the smaller ruins, as the natives through which we had to pass were diseased by the small-pox and fever, and our natives would not go; so we had to return, arriving six weeks after at the mission station at Vitalatolu. The natives living near the ruins are called Kwarri-Kwarri. The country is very unhealthy through the continual fever. Cattle cannot live, as there is a fly called tsetse, which kills them. Plenty of game. A large marble hill."

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

[ISSUED JULY 14TH, 1866.]

SESSION 1865-6.

Twelfth Meeting (ANNIVERSARY), 1 P.M., May 28th, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in
the Chair.

THE business of the Meeting commenced by the Secretary reading the Regulations for the conduct of the Anniversary, and the minutes of the Meeting last year. Admiral Sir Edward Belcher and Charles White, Esq., J.P., were then appointed by the President as Scrutineers of the Ballot.

Captain J. B. Caldbeck; Joel Emanuel, Esq.; W. D. Fox, Esq.; Charles Grey, Esq.; Joseph Hunt, Esq.; W. H. Johnson, Esq.; Wyndham Knatchbull, Esq.; Alexander Lebour, Esq.; Viscount Pollington; Major-General Rivers; were elected Fellows of the Society.

The Report of the Council was next read; its adoption was proposed by General VINCENT EYRE, seconded by Sir MANOOKJEE CURSETJEE, and carried without a dissentient voice.

Mr. J. CRAWFURD next moved that the following clause be added to the Regulations, Chap. II. :—

“ Par. 7.—The Council are empowered to remit the entrance fees and subscriptions in a limited number of cases, where it may be found desirable to elect gentlemen to the Fellowship who are distinguished for their services to Geographical Science, and whose circumstances render it inconvenient to them to make the necessary payments.”

Sir ANDREW SCOTT WAUGH seconded the proposition, which was carried unanimously.

The PRESIDENT then delivered the Royal Medals for the encouragement of geographical science and discovery, the FOUNDER'S MEDAL to Dr. THOMAS THOMSON, M.D., F.R.S., and the PATRON'S MEDAL to Mr. WILLIAM CHANDLESS, M.A., who was represented on the occasion by his brother, Mr. Cecil Long. A Testimonial was afterwards presented to M. P. B. DU CHAILLU, and a gold watch to MOOLA ABDUL MEDJID; the latter being received, in the temporary absence of Sir H. C. Rawlinson, by Viscount Strangford.

After the presentation of the awards, the PRESIDENT read his Annual Address on the progress of Geography. Sir CHARLES NICHOLSON, BART., then moved a vote of thanks to Sir Roderick Murchison, which was seconded by Mr. CHARLES WHITE, and carried by acclamation.

The PRESIDENT replied as follows:—

“Gentlemen,—I return my sincere thanks for your kind approbation of my labours. They certainly have not been inconsiderable; but it has been a work of true pleasure to myself. Whenever I try to put before the world a sketch of the progress of Geography, I do it with zeal; and when I endeavoured to do justice to those eminent men who have recently passed away, you might have perceived, I am sure, that the expressions I made use of came from my heart. My friend Sir Charles Nicholson has made an allusion to my continuance as the President of this Society; but I beg him to recollect that a man who happens to have been born in the year 1792, however much he may have been hitherto approved of, may possibly—and I think it not at all unlikely—have passed next year into the condition of the Archbishop of Toledo, and that his last sermon may not be quite as good as those of earlier date. It is my duty to speak to you as plainly as I do regarding my retirement from the Chair, because I really think that your President should be changed biennially, and that it is by a sort of fiction, only, you have continued to elect me. At the next Anniversary my present term of office will elapse. If you again violate the rule, you offer no encouragement to others to preside over this Society. As the post which I occupy is highly distinguished and honourable, it is one to which others ought to succeed. I hope that, when the next Anniversary arrives, and when I am sure I shall be able to announce to you the continued prosperity of the Society, that you will then have found some person well qualified to occupy this chair, and discharge the important duties which are required of your President.”

The Scrutineers reported the unanimous election of all the officers

recommended by the Council as follows :—*President* : Sir Roderick Impey Murchison, Bart., K.C.B., F.R.S., &c. *Vice-Presidents* : Vice-Admiral Sir G. Back, D.C.L., F.R.S. ; John Crawford, Esq., F.R.S. ; Francis Galton, Esq., M.A., F.R.S. ; Major-General Sir Henry C. Rawlinson, K.C.B., M.P. *Trustees* : Lord Houghton ; Sir Walter C. Trevelyan, Bart. *Secretaries* : Clements R. Markham, Esq., F.S.A. ; R. H. Major, Esq., F.S.A. *Foreign Secretary* : Cyril C. Graham, Esq. *Members of Council* : John Arrowsmith, Esq., F.R.A.S. ; Major-General G. Balfour, C.B., R.A. ; Samuel W. Baker, Esq. ; Thomas H. Brooking, Esq. ; Admiral Lord Colchester ; Rear-Admiral R. Collinson, C.B. ; R. W. Crawford, Esq., M.P. ; Hon. R. Curzon ; Sir William Thomas Denison, F.R.S. ; James Fergusson, Esq., F.R.S. ; Right Hon. Sir Thomas F. Fremantle, Bart. ; W. J. Hamilton, Esq., F.R.S. ; Rear-Admiral Sir John C. Dalrymple Hay, Bart., F.R.S. ; Captain Felix Jones (late I.N.) ; Herman Merivale, Esq. ; Sir Charles Nicholson, Bart. ; Laurence Oliphant, Esq., M.P. ; William Spottiswoode, Esq., M.A., F.R.S. ; Viscount Strangford ; Thomas Thomson, Esq., M.D., F.R.S. ; Major-General Sir A. Scott Waugh, F.R.S. *Treasurer* : Reginald T. Cocks, Esq.

A vote of thanks was in conclusion moved by Colonel THULLIER, to the retiring Members of Council, the Members of Committee, the Auditors, and Scrutineers. It was seconded by Captain JENKINS, I.N., and carried with applause. The Meeting then separated.

PRESENTATION

OF THE

ROYAL AWARDS.

THE Founder's Gold Medal to Dr. THOMAS THOMSON, M.D., F.R.S., for his labours in exploring the Western Himalayas and Tibet, and for his highly valuable work thereon, published in 1852, in which he described, for the first time, the true physical geography of those regions, as well as the botany, geology, and the former and present glacial action in these lofty mountains. The Patron's or Victoria Gold Medal to Mr. WILLIAM CHANDLESS, M.A., for his recent unaided exploration of the River Purûs, from its mouth on the River Amazons nearly to its sources, a distance of 1866 miles, and for laying down the course of this previously undefined great stream by a continuous series of astronomical observations of latitude and longitude and compass bearings.

The PRESIDENT addressed the meeting as follows:—

“ GENTLEMEN,

“ In previous Addresses to the Royal Geographical Society I have dwelt so emphatically upon the value of the researches and work of Dr. Thomas Thomson, that my associates can well suppose the award of the Founder's Medal to this distinguished man has given me the truest satisfaction. Eminent among living naturalists, Dr. Thomson, in the course of his arduous expedition, in which Botany was his chief object, traversed a large tract of wild and mountainous country hitherto unexplored, crossed for the first time the dividing range of the great Asiatic continent, brought back collections that link the labours of the Russian botanists in the north with those of the English in the south, and carefully laid down every feature in the Physical Geography and Geology of the vast elevated region whence the Indus and its tributaries take their rise, amid perpetual glaciers and at enormous heights above the sea.

“ Another rare merit is, that he embodied these researches in

a work which, whether for modesty of style, accuracy, as well as breadth of view, or as being the first to demonstrate the true physical structure of the mountain masses of North-Western India and trace their water systems, climate, and productions, must be considered as of the highest value by naturalists, geographers, and geologists.

"To Dr. Thomson we owe the final abandonment of an idea long prevalent, and which was entertained even by my illustrious friend Humboldt, that Tibet was an elevated plain or plateau; and with this fell also many subsidiary theories relating to the snow-line, glaciers, temperature, and climate of Central Asia. In short, from the date of Thomson's researches, rational superseded conjectural geography as regarded that vast and still to a great extent unexplored area.

"These are not merely my words—they are those of that eminent naturalist, Joseph Hooker, whose explorations in the Eastern Himalayas rival those of Thomas Thomson in the West. They were also the matured opinions of the late distinguished and ever-to-be-regretted Edward Forbes.

"Not content with his exertions in the North-West, Thomson applied on their completion for leave to explore the Eastern Himalayas, and for this purpose joined Dr. Hooker in Sikkim, spending a year and a half there, and in the Khasia hills of Eastern Bengal, before he returned to Europe on furlough.

"Now, when I inform you, my associates, that for all these devoted and important services Dr. Thomson never received any reward, nor even public thanks, but, on the contrary, was left to publish his work at his own cost and to his heavy loss, you will all rejoice with me that, although we have much too long delayed our gift, we have at last placed ourselves in a befitting position by rendering justice and all honour to such a distinguished man."

The PRESIDENT then addressed the Medallist in these words:—

"Dr. THOMSON,

"The opinions which are expressed in the brief estimate of your merit which I have just read, will find, I am sure, an echo not merely in this Society, but in every scientific body of Britain and her colonies. Let me assure you that, often as it has fallen to my lot to present our Medals to men distinguished for their boldness of adventure, I can bring to mind no occasion in which intrepidity and perseverance were more happily united with high scientific acquirement than they were in your own person, when you carried out those admirable researches for which we gratefully offer you our highest honour.

"I have, indeed, a peculiar pleasure in placing this Medal in your hands in the presence not only of some distinguished botanists of our own country, but also of foreign botanists, headed by that eminent man, M. de Candolle; for I am certain they feel as strongly

as I do, that the researches of the Botanist and the Geographer are essentially bound up together, as indeed the great results obtained by Humboldt, Robert Brown and others, as well as by yourself, have abundantly demonstrated."

Dr. THOMSON replied :

"SIR,—I have no words to express my sense of the very unexpected honour conferred on me, through you, by the Royal Geographical Society. Its value is, if possible, much enhanced by the very flattering manner in which you have been so good as to speak of my humble services to geography. As we all know, a traveller in new or little known countries finds in the success of his explorations an ample reward for all his toils : I scarcely expected that the observations I made should be remembered at all after so many years. It is therefore especially gratifying to me to find that they are regarded as of importance by such high authority. I beg to thank you again most cordially for the honour you have conferred on me."

M. DE CANDOLLE then rose, and in a few words expressed his great satisfaction at being present when the highest reward of the Royal Geographical Society was bestowed on a botanical traveller. He corroborated the statements of the President, with regard to the high value of the researches of Dr. Thomson in the Western Himalayas and Tibet, which, in conjunction with those of Russian *savans* in the North, had thrown great light on the Botanical Geography of inner Asia.

The PRESIDENT next addressed himself to Mr. Cecil Long, the brother of the recipient of the Victoria or Patron's Medal :—

"Mr. LONG,

"The brilliancy and completeness of the geographical exploit of your brother, Mr. William Chandless, in tracing by his own unaided exertions the whole course of the River Purûs, one of the longest of the tributaries of the Amazons, so impressed my colleagues of the Council of this Society, that he was at once fixed upon as meriting one of the Gold Medals of the present year. I can truly say that in this decision I entirely concurred. The Purûs has been, from nearly the foundation of this Society, a river in which we have taken the greatest interest, and the memoirs which have been published upon it in the volumes of our Journal have testified to the importance and the difficulty of obtaining a correct knowledge of the course and direction of a stream known to be of great magnitude and navigability. Accounts had been published, showing the almost insurmountable nature of the obstacles to the exploration of the river in Southern Peru, supposed to be the upper portion of the Purûs, and information had reached us of several unsuccessful attempts on the

part of expeditions despatched by the Brazilian Government to ascend it from its mouth. Our surprise and gratification may, therefore, be well conceived when we received the news that an English private gentleman, travelling in South America for the pure love of science, had applied himself unostentatiously to the solution of this geographical problem, and had been completely successful. He had qualified himself for such an undertaking by previous travels in different parts of both South and North America, particularly by his exploration of the River Tapajos, an account of which he communicated to this Society in 1862, and by his journey across North America, as narrated in a work he published, entitled 'A Visit to the Salt Lake.' And now, providing himself with suitable instruments for surveying, and embarking with only one servant in a small canoe of the country manned by Indians, he ascended the great river for 1866 miles, and has sent us as a result of his work a map of its whole course, projected by himself with great minuteness from his own observations. Not content with this first arduous survey, he resolved to ascend the river a second time, and explore its principal tributary with a view to settle the question of its supposed connection with the rivers of Southern Peru; and I rejoice to hear that he has returned successful from his second voyage, and has mapped the tributary with the same minuteness as he had previously done the main stream.

"I cannot but admire the boldness with which such undertakings have been conceived and the skill with which their results have been worked out. The great danger encountered in travelling for months through a country of interminable forest, in which lurk hordes of savage Indians, is shown in the treacherous slaughter of your brother's servant and his boat's crew in descending the river. The result of Mr. Chandless's survey has been the laying down a vast tract of country previously unexplored, and a profound modification of all our maps of the interior of tropical South America. I entrust this well-earned mark of the esteem of Geographers to you, Sir, in the hope that you as well as ourselves may be gratified with the safe return of your brother, on the termination of his self-imposed labours."

Mr. LONG then spoke as follows:—

"Sir R. MURCHISON,—On behalf of my brother, William Chandless, I accept with heartfelt pleasure the Gold Medal that the Royal Geographical Society have conferred upon him; for it is a testimonial from this great and important body, that they admire the zeal and energy displayed by my brother in his explorations, and set a high value upon the results of his labours. Although, indeed, with him they have been labours of love, undertaken and prosecuted with no desire of reward, but simply for the love of geographical investigation. In truth, so little does my brother anticipate what

is passing here to-day, so humble is his estimate of the interest that will be taken here in his discoveries—that in his last letter from the Amazons, written since his return from his recent visit to the River Aquiry, he says, ‘I shall probably send a paper of five or six pages about it to the Royal Geographical Society; but one must not try their patience too far.’ And, Sir, if anything could add to my pride and pleasure on this occasion, it would be the warm approval with which the learned and distinguished audience around me received the kind words with which you presented me this Medal, and the sketch you gave of my brother's career and travels, making them clear to all your hearers by the powerful aid of your own profound knowledge. To you, Sir, and, through you as President, to the Royal Geographical Society, I beg on behalf of my brother and myself to tender our warmest thanks. I regret exceedingly that he is not here to-day, to vindicate, in language more appropriate than I can command, and especially by the simple relation of his story, the choice of the Society. But it will be my duty to transmit to him, in South America, a faithful record of this day's proceedings. And I shall hope hereafter to be the vehicle of conveying to the Royal Geographical Society my brother's grateful thanks for the honour they have conferred upon him and his high appreciation of their approval.”

A testimonial, value 100 guineas, was then presented to M. du Chaillu, to reimburse him for the loss of his instruments in Western Africa, and as a testimonial of the importance of his services in making numerous astronomical observations to fix positions, which have much improved the cartography of the region he explored.

In presenting the testimonial, the PRESIDENT thus spoke:—

“M. DU CHAILLU,

“I have expressed to the Royal Geographical Society, on more than one occasion, my admiration of the zeal with which you fitted out your last expedition, and of the devotion with which you endeavoured to carry it out. I congratulate you on having demonstrated the truthfulness of your former observations, particularly as relates to the Natural History of the region you explored, and for the many good astronomical observations which have enabled you to construct a more correct map of the country near the coast.

“Your bold and perilous endeavour to penetrate into the heart of Africa from the West Coast merited our warmest thanks; and, had it not been for the unfortunate accident which at once put an end to your advance, and nearly proved fatal to yourself, I have no doubt that you would, at no distant day, have won the same honours which have been conferred upon a Barth, a Livingstone, a Burton, a Speke, a Grant, and a Baker.

“Accept, then, this token of our regard, and view it as a mark of our approbation and as an incentive to future exertion.”

M. DU CHAILLU replied as follows :—

“ Sir RODERICK and Gentlemen,—Allow me to thank you for the generous manner in which you have spoken of my past labours. I accept this testimonial as a proof of the interest which the Council of the Royal Geographical Society take in my attempts to penetrate the unknown region of Equatorial Western Africa. I can only say I wish I had done more; but it has been my lot, as all true geographers well know,—and I say it without wishing to arrogate any undue credit for myself,—to have for my task the exploration of the most difficult field in the whole of Africa. On almost every other side of the continent there has existed trade, and caravans of traders, from the coast into the interior, which have in some degree opened the way to travellers; but inland from the Fernand Vaz and Gaboon no trader has ever been farther than a few miles, and the interior is a region of mountains and impenetrable forests. Notwithstanding, I succeeded in penetrating about 400 miles, and shall ever regret the accident which prevented me from going farther. In conclusion, permit me, Mr. President, to thank you for the kind feelings you have always entertained towards me.”

A gold watch, value 26*l.* 5*s.*, was awarded to Moola Abdul Medjid, for the service he has rendered to geographical science by his adventurous journey from Peshawer to Kokand, along the upper valley of the Oxus and across the Pamir Steppes.

The PRESIDENT, in presenting the watch, stated that Sir Henry Rawlinson, who had proposed this award in the Council, and who would have been the most fitting person to receive it on this occasion, was unavoidably absent. He trusted, however, that Lord Strangford would fulfil this duty, as he had entirely participated in the feelings and opinion of Sir Henry. He would therefore place it in his hands, in the hope that, through Sir Henry Rawlinson and the Indian Government, he would have the watch conveyed to the excellent native observer who had so well earned it. It had been stated that such gifts as these, from time to time, would stimulate a superior class of our Indian subjects to make further explorations of this nature, and be otherwise productive of much good. He therefore had great pleasure in bestowing this award.”

LORD STRANGFORD said :—

“ Gentlemen,—As Sir Roderick has informed you, the award of this watch was proposed in our Council, and I fully concurred in the proposal; but I regret that the duty of receiving it has, through accident, fallen upon me. Sir Henry Rawlinson is a better representative of Asiatics than I can hope to be. I feel, however, much gratification in acting on the present occasion, as represen-

tative man on behalf of so vast and in some respects so highly civilised a community as our Indian subjects. I think that the present occasion is one of something more than geographical significance. It is a matter of very great importance to find so good an occasion to bind that community to us by scientific as well as political links. To us as geographers it is a great advantage to have the means of exploring countries inaccessible to Europeans, in the co-operation of these meritorious native travellers. I beg leave, in the name of Moola Abdul Medjid and of the native community of India, to return thanks for this testimonial to the President and to the Society.

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY.

Delivered at the Anniversary Meeting on the 28th May, 1866,

BY SIR RODERICK IMPEY MURCHISON, BART., K.C.B.,
PRESIDENT.

GENTLEMEN,

In this the twelfth Address which I have had the privilege of delivering to you, I have still the satisfaction of announcing that our Society is advancing in prosperity and flourishing with undiminished vigour. I have also once more to congratulate you on that which was a new feature last year—the issue of the annual volume of the Journal long before our Anniversary. This result is entirely due to the zeal and devotion of our Assistant-Secretary, Mr. H. W. Bates; and when you consider the additional labours he has to undergo in also editing the voluminous records of our Meetings and in conducting much ordinary business, you will unite with me in offering to him our hearty thanks.

If, during a large portion of the Session that has passed, we lost the services of our Senior Secretary, Mr. Clements Markham, it will be my pleasing duty, in another part of this Address, to call your attention to the highly important services he has rendered to his country during his recent journeys through various parts of British India. His place has, as you know, been well filled *ad interim* by Mr. Major, who, now that, to my great regret, we lose the services of Mr. L. Oliphant on account of his parliamentary duties, will, I trust, be elected by you to occupy the vacant place.

As at the last Anniversary, I will not attempt to treat of all the varied topics which have been under your consideration during the past Session, but will touch upon those subjects only which

have most interested me. These general observations, as on former occasions, will be preceded by a record of the lives of our deceased Fellows, as well as by a review of the Admiralty Surveys, as prepared by the Hydrographer, which important document necessarily takes a prominent place on such an occasion in this maritime country.

OBITUARY.

I naturally commence the record of our deceased Associates by a short notice, however imperfect, of the life of the illustrious English statesman, whose death on the 18th October last produced a thrill of sorrow throughout the nation.

As the leading events in the life of Lord PALMERSTON form a large portion of the history of this century it would be quite out of place were I now to attempt to enter upon so vast a theme. I will, therefore, simply advert to those features of his character which marked his acquirements and his love of science, as well as to those traits of goodness and heartiness which so endeared him to a large circle of friends and admirers.

In early life he was educated at Harrow School, and truly any of us who have seen him on the Speech days riding from London to his old school and back, when he was approaching his 80th year, may well say that he was a brave Harrow boy to the last.

In the next phase of his education I rejoice as a Scotsman to reflect upon the fact, that at the University of Edinburgh, and under the tuition of Dugald Stewart, Playfair, and other eminent men, the mind of young Henry Temple was stored with that solid and practical knowledge on which much of his future success depended. Next, at Cambridge he attached himself so earnestly to mathematical studies, that throughout life the solution of a problem was with him quite a natural process, which, in eliciting a new train of thought, relieved that official drudgery which he adopted as a fixed rule, and ever adhered to with unswerving perseverance.

I may, indeed, add, that when a new discovery in Chemistry or Physics was made, he always endeavoured to master the subject, showing, by his sagacious questions, how deeply he had reflected upon the information communicated to him orally by some scientific friend, when the pressure of public business prevented his reading the memoirs in which such discoveries were described.*

* This fact, particularly in relation to the great discovery of the spectrum analysis, and some of the recent researches of M. Foucault, was communicated to me by my friend Sir Henry Holland, the President of the Royal Institution.

In perusing the terse and well-reasoned despatches, or in listening to the speeches of Lord Palmerston, I always felt that it was to the scientific superstructure reared at Edinburgh and Cambridge upon the classical groundwork of Harrow, that this eminent man mainly owed his superiority over most of his contemporaries. Logic and method were always combined in him with ready wit and unfailing good humour.

His long administration of Foreign Affairs necessarily led him to take a deep interest in Geography, but particularly in the boundaries and territorial rights of nations, as secured by treaties or established by legitimate national exertions. Of all researches in distant parts, he was most attached to those made in Africa, inasmuch as throughout life he was forward, resolute, and unflinching in every measure which led to and carried out the abolition of the Slave-trade. Hence it was that the good Livingstone has told me, that he considered Lord Palmerston to be the most firm and genuine philanthropist he had ever known, and for that reason had dedicated to him his last work on Southern Africa. Whilst on this point let me say, that if Lord Palmerston were alive I feel certain that, with his anxious desire to ameliorate the condition of the negro races by introducing lawful commerce into their prolific country, teeming as it does, particularly on the West Coast, with produce of great value, he would have continued to sustain the recently-formed pioneer establishment on the Niger, which, under the direction of our lamented associate, Dr. Baikie (whose death I dwelt upon last year), has attained to so high a degree of prosperity. Recently, indeed, we have seen that able naval officer, Commodore Wilmot, who has so long commanded on the West African coast, lamenting bitterly over the suggested abandonment of all the advantages we had obtained, accompanied, as he states, by the prospect of returning to the former state of barbarous warfare among the native tribes, in lieu of a peaceable and profitable traffic by which they were rising in the scale of humanity.

From frequent personal intercourse with the late Premier, I can testify that he had the sincerest desire to advance every branch of science. Thus the acquirements of his youth enabled him to shine forth conspicuously in the year 1846, when he attended the meeting of the British Association at Southampton, over which I presided, and when he spoke eloquently and energetically in favour of that great institution in presence of the Prince Consort. Again, whether in granting to the Royal and other scientific Societies apartments in

Burlington House, including the very Hall in which I now address you, or in lending a willing ear to the claims of impoverished men of science and their families, he was ever our true and enlightened patron.

Let me add that Lord Palmerston was an assiduous and untiring man of business, to which, when Foreign Secretary, he devoted from eight to ten or even twelve hours a day. His constant practice, as one of his oldest associates has told me, was to sketch out a reply to every despatch of note as he read it; and in these sketches there was seldom any erasure or alteration. His style of writing was singularly direct, logical, and lucid, and his language the purest English. The handwriting was as muscular and bold as the matter was plain and intelligible. There was no mistaking either, though he thought and wrote with prodigious rapidity.

Lord Palmerston had a great facility for acquiring languages. At his own table you might hear him speaking to foreigners successively in French, Italian, and Spanish, with perfect fluency and a remarkably correct pronunciation.

When at Broadlands after a Parliamentary campaign he still stuck to official business with unflagging assiduity and tenacity, devoting to it hour after hour. In the afternoon, and when sporting friends were there, he would join in shooting, enlivening the party with many a good story. At other times he would ride a good distance to meet the foxhounds, and then follow them better and straighter than most of his younger associates. For, when in his saddle, Lord Palmerston was truly a premier among horsemen, his hand being as fine as his seat was firm. It was quite impossible for him to remain inactive, and when his public business was settled, and hunting or shooting were not the order of the day, he would row on the clear river Test, which flows by Broadlands, or look over his young racing stud, or take a long and fast ride on one of his high-bred roadsters. In the evening, when in the country, it was his habit to play a game or two of billiards, though he invariably returned to his official boxes for a revision of his papers before he retired to rest. With all his devotion to work, nobody enjoyed social intercourse more than Lord Palmerston; and those who have had the privilege of his acquaintance and have witnessed the joyousness communicated to the circle around him by his genial flow of conversation, aided as it was by the grace of the charming lady who so deeply mourns his loss, will unite with me in declaring that his residences in town and country were

centres of attraction, such as we cannot hope to see equalled in this generation.

Lastly, it is my pride to remind you, that during a long, eventful, and successful career, he ever adhered to and supported his friends of all classes with cordial sincerity; and it was this feature in his character, united as it was with undaunted public spirit and frank and open manners, that justly rendered Lord Palmerston so cherished a favourite of the British nation.

WHEWELL.—By the recent fatal accident which caused the death of Dr. William Whewell, the late Master of Trinity College, Cambridge, the world of science and letters has lost one of its brightest ornaments, while his large-heartedness endeared him to numerous friends, among whom I was proud to be numbered.

It is for others more competent than myself to dilate upon his almost universal acquirements; and, leaving it to the President of the Royal Society to notice his numerous contributions to physical science, I will treat only of the character of my lamented friend in some of those aspects of the philosopher with which I have been familiar.

Endowed with the most capacious grasp of intellect, it was the resolute will and energy of Whewell which, elaborating the advances made by numerous observers and philosophers past and present, gave him so strong a hold upon the minds of his contemporaries. When the British Association was founded in 1831, it was through his suggestion to the Rev. W. Vernon Harcourt, the eminent lawgiver of that great Institution, that the system of publishing Annual Reports on the various branches of Science was adopted. At the first Cambridge meeting of that body (1833), when he was a Tutor of Trinity College, I can affirm that, to his unbounded zeal, untiring perseverance, and methodical arrangements, the success of the meeting was as much due, as it was to the eloquence and popularity of his senior, Professor Sedgwick. It was then, indeed, quite apparent that, if Whewell should live, a quarter of a century would not pass over without producing rich and fruitful results. The versatility of the genius of the man has been demonstrated not merely in his various publications, but also in the offices which he successively held; for, capable as he was of unfolding and explaining the most elaborate arguments of the metaphysician as Professor of Casuistry, we next find him lecturing on Mineralogy, and bringing all his mathematical knowledge to bear upon Crystallography.

It was the high position which he took up as a mineralogist which induced the Geologists to place him at their head; and, after presiding over the Geological Society of London during two years, he left behind him in his Addresses a series of broad views which connect Geology in a masterly manner with many other branches of Natural History; whilst his masculine eloquence had the happiest effect in marking out for his associates the future bearing of their researches. In truth, he was so rich in accomplishments that he was well qualified to preside over any scientific Society. Nay, more, we may well extend the capacities he possessed to art—at least to antiquities and architecture, for in these departments he was equally an adept.

In addition to his sterling knowledge in science as well as classical lore, Whewell had a warm poetical verve, as proved by his composition of a collection of English hexameter verses. He further possessed great facility with his pencil, in delineating, not only the forms of architecture, but also the features of a landscape. In the last-mentioned accomplishment I shall ever remember the rapid but truthful sketch which, in a few minutes, he made in my presence of the Wren's Nest near Dudley,—a sketch which I published in the 'Silurian System.'*

Amid his almost countless employments, those persons only who have closely watched his career are aware that, in the years 1826 and 1828, while occupied with Professor Airy in ascertaining the density of the earth by observations carried on in the deepest mines of Cornwall, "he lived (as he tells us himself) for four months the life of a labouring miner."†

Among his numerous qualifications it is now, however, my special duty to affirm that our deceased associate was a sound Geographer. His strong point, indeed, was the world known to the ancients, but he also took the most intense interest in every new discovery in remote regions, and in every addition to our knowledge made by distant travellers.

Again, he continually endeavoured to aid the advance of our science by contributions of a high intellectual cast, as proved by his remarkable memoir on the Tides, published in the 'Philosophical Transactions.' Although not a contributor by name to our volumes, it is further my duty to honour his memory by stating

* See p. 485, also 'Siluria,' p. 131.

† See the end of his address as President of the British Association at the Plymouth Meeting, Report of 1841.

that several passages in my own works relating to the power of waves of translation and currents, are from the pen of this untiring writer, who not only found time to produce works of sound classification, and to direct the affairs and government of a great College, but also to assist any friend who he saw was struggling to enunciate important physical truths, of which the writer felt the value, but could not express them with the lucidity and power of a Whewell.

Recurring to the Addresses which he delivered to the Geological Society, we find in them the same clear definitions of the branches of that science as those which he affixed to other divisions of the sciences. His separation, for example, of all geological works into great classes, "Descriptive" and "Dynamical," and his vivid perception of the imperishable truths which were being chronicled in the first-mentioned of these classes, afforded, as I can testify, great comfort to those of us who were then gathering together positive data, which we hoped might be hereafter regarded as established landmarks. On the other hand, when he dwelt upon what he termed "Geological Dynamics," his writings show that he clearly saw what a struggle would ensue, and how long it would continue, between speculators who compared the grand ancient revolutions of the surface of the globe with the changes of which history affords us any examples. It was he, indeed, who first proposed the names which have since been affixed to the two great classes of geologists, "Catastrophists" and "Uniformitarians." In reference to these names I may state from my own knowledge that Whewell agreed with Buckland, Sedgwick, Von Buch, Humboldt, myself, and many others, that the vast oscillations which took place between land and water in very remote periods, as well as the abrupt dislocations, and often inversions on a vast scale, of the strata composing mountain masses, were only to be explained by operations of far greater intensity than those of which mankind have ever had any examples, and at the same time that many of these are phenomena wholly inexplicable by any amount of draft upon time.

But, as I am addressing Geographers, I must now offer an explanation, which would not be required were this Address delivered to my brother Geologists. In speaking of Uniformitarians, as Whewell defined those geologists to be, whose leader is my eminent friend Lyell, the worthy inheritor of the mantle of Hutton and Playfair, let it not be supposed that any reasonable geologist, certainly not myself, who may dwell upon the great and sudden dislocations which he believes the crust of the earth underwent from time to time in

far bygone periods, is not also a strenuous advocate of an uniformity of causation as respects the enormously long and undisturbed periods required to account for the accumulation of the thick sedimentary deposits. On the other hand, unbiased Uniformitarians now admit of occasional catastrophic action; and, as the question is thus reduced to be one of degree only—that degree to be fairly gauged by measuring the relations and extent of the ruptures of the crust of the earth—I feel confident that out of fair discussion the exact truth will ultimately be obtained.

In the last of his Geological Addresses, Dr. Whewell told his auditors, that he considered the great theorizers of the past as belonging to the fabulous period, whilst he flattered the hard-working field geologists of our day by saying, that “the men who were around him belonged to the heroic age of geology, and that it was the destiny of the science to pass therefrom to the historical period.” Now, after a lapse of twenty years since these words were spoken, this is just the transition which is now taking place. We may therefore treasure up this saying of a man whose occupations through life had been to trace the principles and laws by which the progress of human knowledge is regulated from age to age in each of its provinces, and to estimate its future advance.

When, indeed, those who were intimate with Dr. Whewell look back to the state of the University of Cambridge when he was in his fullest vigour, and had for his contemporaries a Sedgwick, a Herschel, a Peacock, an Airy, a Henslow, and a Hopkins, we may well talk of that as the heroic age of science, since we can scarcely expect to see again, at any one time, so many great minds rivalling each other as were then the teachers of British youth in the famous University of Newton.

In his exhaustive essay on the ‘Principles of English University Education,’* it is refreshing to find how successfully Whewell maintains the necessity of instructing the youth as equally and essentially in classical knowledge as in mathematics, the physical sciences, and modern languages; and, referring back to the earliest standard examples of poetry, eloquence, history, criticism, grammar, and etymology, he thus writes:—“All the civilized world has been one intellectual nation, and it is this which has made it so great and so prosperous a nation. All the countries of lettered Europe have been one body, because the same nutriment, the literature of

* Parker, Strand, 1837.

the ancient world, was conveyed to all by the organization of their institutions of education.”* And this is said by the mathematician who by some was considered to be too exclusive a favourer of those scientific studies which have elicited the noblest results of modern intellect!

No one, indeed, can read the peroration of this remarkable essay without being warmed by the generous enthusiasm of the man who, in sustaining the true value of English University Education, looked to its right administration as “involving the welfare of countless generations of Englishmen yet unborn, and of centuries of English civilization yet only in the germ.”

Proud of the great College in which he had been reared, and of which he was so many years the Master, it is pleasing to record that Whewell applied during his life large sums of money to the erection of new halls, whilst, in addition to many acts of munificence, his death was marked by a kindly consideration of his successor (whoever he might be) in the Mastership, and to whom he bequeathed the chief contents in the interior of Trinity Lodge. Let me here add, that if his manners were occasionally abrupt, there never was a more kindhearted being; and it was this inbred quality which so endeared him to all his old friends.

Having heard it said that, great as was the Master of Trinity, he lacked inventive genius, I cannot close this brief and imperfect record of his merits without offering a set-off to this criticism. For, though the name of Whewell is not enrolled among those who have had the good fortune to be illustrated by great discoveries in science, he has done that for scientific research which leads many into the paths of discovery. Like the illustrious Bacon, the first great teacher of inductive philosophy, and with a similar comprehensive survey of the intellectual world, he has pointed out at once the direction in which science has hitherto moved, as well as that which is hereafter to be the line of its advance, and thus has reared for himself a solid memorial of his eminence.

Admiral WILLIAM HENRY SMYTH, C.B., who was taken from us in September last, at the age of seventy-seven, was distinguished as an astronomer and an antiquary, as well as a geographer,—acquirements rarely united in the person of one who in his early career had been so conspicuous for his gallantry in the naval service of his country. A record of those public services is given in the Anniversary Report

* ‘English University Education,’ p. 35.

of the Royal Astronomical Society. The important point on which I have first to comment is, that during the war which ended in 1815, he was signalised not only by various acts of devotion and courage, but also by carrying on, when only a Lieutenant in the Royal Navy, an extensive series of hydrographical observations between Sicily and the coasts of Italy and Africa. For this service he was promoted to the rank of Commander. Whilst his full and striking description of Sicily and the adjacent islands was published in 1824, he was actively engaged in completing his hydrographical surveys in the Mediterranean, in which he was continuously occupied during ten years, displaying so much ability and accuracy that he fairly won for himself the name of "Mediterranean Smyth." It was during these surveys that he collected antiquarian relics from the ruins of Lepti Magna, in Barbary; and it was also in these years that he matured that love for astronomical observation which clung to him through life, the most striking proof of which was the establishment, at his own cost, of an observatory at Bedford. Those persons who, like myself, visited him when he had just completed that building, have a lively recollection of the zeal with which he was supported in carrying out his views by that highly accomplished lady his wife.

His equatorial refractor being one of the first constructed in this country, and which had attached to it all the improved apparatus and adjustments of that day, he was enabled by it to make a series of observations of the highest value; and continuing those after his instruments had been transferred to Hartwell, the residence of Dr. Lee, he published his 'Cycle of Celestial Objects,' in 1844, including his Bedford Catalogue; and for this work he was rewarded with the gold medal of the Astronomical Society. After that period, we learn from the truthful sketch of his life by Mr. Isaac Fletcher, F.R.S., that he continued his astronomical labours with untiring zeal to near the close of his valuable life. That friend and brother astronomer, supported in his opinion by such authorities as Herschel and Airy, has well said of Admiral Smyth, that as a geographer, a hydrographer, a numismatist, and an antiquary, he was equally distinguished as in astronomy, by the depth of his inquiry, his untiring industry, and the sagacity of his deductions.

It is, however, in this hall that I claim to speak specially of our departed associate as a geographer who was thoroughly entitled to preside over us, whilst it is peculiarly gratifying to me to remind you, that to no one of our leaders do we owe a

truer debt of gratitude than to Admiral Smyth. Though he was not the actual founder of our Society, as explained in my address of last year,* it is certain that in the very year of our origin Admiral Smyth sketched out the project of a Geographical Society, and had absolutely enrolled many good men in furtherance of it. To the conduct which he pursued during his presidency, in the years 1849-50, I hesitate not to repeat, what I expressed when I succeeded him, is due the first step in advance which led to our present prosperous condition. Such was the energy and ability with which he brought our geographical ship into trim, that when he handed her over to me I had little more to do than to let her run before the favouring breeze which my gallant friend had taken advantage of, and by which he had steered us, with such ability and tact, towards a safe haven.

Among the numerous good services which he willingly rendered to me in the performance of my duties, it gave me pleasure to state that the feeling notice of the life and death of his brother officer, the late Duke of Northumberland, as published in my last Anniversary Address, was from his pen, and it evidently came from the heart of the man whose loss we now mourn.

It was impossible to know Admiral Smyth, and to mark the zeal and fidelity with which he carried out every object at which he aimed, without feeling that he was one of the finest types of the old British seaman. The celebrated Captain John Smith, who was termed "the saviour of Virginia," the grandfather of our deceased associate, lost all the fortunes of the family by his adherence to the Royal cause in North America; and this is just what our lamented Admiral would have done if placed in a like position, so truly loyal was he in heart and conduct.

Beloved by a very numerous circle of friends, and respected in every scientific and literary Society to which he belonged, Admiral Smyth has bequeathed a spotless and honoured name to his sons, one of whom is now worthily the President of the Geological Society, and another the Royal Astronomer in Scotland; whilst his devoted widow can reflect with just pride on those astronomical achievements of her gifted and excellent husband in which she bore no inconspicuous a part.

Sir William Jackson Hooker, K.H.—This eminent botanist, who for more than half a century had occupied a prominent place in

* See Journal R.G.S., vol. 35, p. cxxxvii, note.

science, and who throughout his long career laboured incessantly for its furtherance, died at Kew on the 13th August last, in his eighty-first year. Sir W. Hooker's whole heart was given to the advancement of Botany, but in promoting its progress he also rendered many important services to Geography. As the Presidents of other scientific Societies, particularly the Linnean, will doubtless place on record his many claims to a high rank among botanists, it would be out of place on my part to enumerate the long series of his works which have borne testimony to the wide range of his knowledge, the ready skill of his pencil, the energy of his character, and to the perseverance with which he worked on till the very end of his meritorious life. It must be my object to glance at his career chiefly as it bore upon our own science, and to note what Geography has gained by his labours.

Descended from a family already boasting of more than one illustrious name, W. J. Hooker was born at Norwich on the 6th of July, 1785. Succeeding, as soon as he came of age, to a competency left him by his godfather, he was able to gratify his taste for travelling and science without the necessity of adopting a profession. Having in his youth enjoyed the friendship of three very eminent zoologists, Kirby, Spence, and Macleay, his first choice was Entomology and Ornithology, on the study of which he entered with all the enthusiasm of his character. Fortunately for Botany, Sir J. E. Smith, the then President of the Linnean Society, was also a Norwich man. With him Hooker was brought into intimate communication by the fortunate accident of his discovery for the first time in Britain of a peculiar moss, the *Buxbaumia aphylla*. Smith introduced him to Dawson Turner, of Yarmouth, an eminent cryptogamist, whose daughter he afterwards married. The love of Botany, thus accidentally developed, grew rapidly under the fostering care of these eminent men, and under the fascinating influence of that precious Linnean Herbarium, of which Sir James Smith was the fortunate possessor. Thenceforward devoting himself entirely to Botany, Hooker soon set before himself as his main object the formation of a herbarium—an ambition which, as is well known, he ultimately realised with a completeness of success far exceeding anything he could have thought possible at the beginning of his career.

To extend the Herbarium, his lengthened tours in Scotland in 1807 and 1808, extending to the Orkneys and Hebrides, were followed by a voyage to Iceland, made at the suggestion of Sir Joseph Banks, himself an Icelandic traveller. Unfortunately for science

Mr. Hooker lost all his collections and most of his notes through the destruction by fire of the vessel in which he was returning—a calamity from which he only escaped with life by the fortunate presence of another vessel close at hand. His 'Recollections of a tour in Iceland,' published at Yarmouth, though prepared, as the title declares, mainly from memory, may even now be consulted with advantage for the narrative, as well as for much careful research.

Having thus personally explored Scotland and Iceland, he was next led to take a special interest in the Arctic and Scandinavian flora; for just at that time the first of the many explorations by land and sea in search of the North-West Passage was made. He thus became the intimate friend of Parry, Franklin, Richardson, Beechey, and James Ross, all of whom entrusted to him for publication their botanical treasures brought from those icy regions.

In 1814 the opening of the Continent enabled Hooker to make an extended tour through France, Switzerland, and Northern Italy; and in 1820 he went to Glasgow as Professor of Botany, where he remained for twenty years. During that period he was an admirable teacher, exciting in his pupils the highest enthusiasm by the animating style and clearness of his lectures, and still more by the annual excursions to the Highlands, in the course of which he never failed to convey to those who accompanied him a portion of his own love of Nature and her works. Glasgow was then, as it is now, an important medical school, and the number of graduates very large; all were required to attend a course of Botany, and many studying with great zeal, acquired among other things a love of exploration. Numbers entered the army, navy, and Indian medical service, or sought other positions in foreign countries. To all of these Sir William Hooker was ready to lend a helping hand, guiding their studies while pupils, and furthering their interests afterwards, well satisfied to be repaid by a share of their collections, the labour of publication often devolving upon him. Although in all this his first object was Botany, yet that science being intimately related to Geography, the furtherance of the one science led necessarily to the advancement of the other, and thus zealous botanists of his own training were successively spread almost broadcast over the face of the globe. Besides Dr. Clarke Abel, who at his recommendation became the naturalist to Lord Amherst's embassy to China, I may name, amongst his other pupils who rendered good service to Geography, Gardner, the Brazilian traveller, Scoules, who explored

North-West America, as well as Douglas and Drummond, both naturalists attached to Arctic expeditions. Above all, let me name our medallist of this year, Dr. Thomas Thomson, the explorer of the Western Himalayas, and Dr. Joseph Hooker, the son of my deceased friend, so well known as an antarctic voyager and for his admirable work on the Eastern Himalayas, and who has worthily succeeded his excellent father as Director of the Royal Gardens of Kew.

Nor was Sir William Hooker's foreign correspondence confined to his former pupils. Indefatigable as a letter writer, and strictly punctual in reply, he attended to all who applied to him for information, and thus knew everything which was done in his favourite science all over the world. He was, therefore, from an early period referred to by those who had scientific appointments in their gift, and indeed even when not referred to was wont, as I can testify, to watch every proposed geographical expedition and to urge upon the authorities the importance of attaching to it a naturalist. In his great knowledge of the vegetable productions of our colonies originated the happy idea of that great work, the 'Colonial Floras,' the first part of which was his own 'Flora Boreali-Americana.' Other parts, such as those of Ceylon and Hong Kong, are finished, and those of the Cape of Good Hope and Australia are now in progress, and the whole, it may be hoped, will be completed before many years elapse. Though none of these, except the first part, were his own work, he looked on them all with parental interest, for they originated in his own suggestion and were sanctioned by the Crown on his urgent representation of their importance.

It was in 1840 that Sir William Hooker left Glasgow for Kew, where for a quarter of a century he laboured most successfully in the development of the Royal Gardens, without allowing his other labours in the least to flag. What these gardens now are we all know; but to appreciate fully his merits we must recollect, as I well do, what they were when he took charge of them. We may, indeed, truly say that no more enduring memorials of his life could be desired than these noble grounds, that magnificent winter garden, though still unfinished, and the splendid museums, full of vegetable treasures from all parts of the world.

Universally beloved at home, Sir William Hooker was also honoured and esteemed in many foreign Societies in which science is cultivated, and they rejoiced to bestow on him their honorary distinctions. As Director of the Royal Gardens at Kew, he was of

pre-eminent service to Botany through the independent action which, much to the honour of our Government, he was allowed to exercise in the management of that great and attractive national establishment. Supported by adequate grants of the public money, he invariably used them with solid judgment and good taste; thus demonstrating by the works he has left behind him, that the best, if not the only true method of advancing any branch of science, is to entrust its management to a well-skilled responsible chief, and not to embarrass and dwarf it by affiliation with other and alien divisions of the public service, of which, owing to a habit of bureaucratic organisation of our so-called "Departments," there are in this country some striking examples.

Without enumerating his numerous foreign titles, I may state that, in addition to a knighthood of the Guelphic order, conferred on him by William IV., Sir William was a Fellow of the Royal, Linnean and Royal Geographical Societies, and was most worthily honoured by the University of Oxford with the distinction of Doctor of Civil Laws.

Sir John RICHARDSON, C.B.—The Society has lost another of those eminent men who have distinguished themselves in Arctic discovery. John Richardson, the intrepid companion of Franklin, was born at Dumfries in the year 1787, and educated at the grammar-school there until he reached the age of fourteen, when he was transferred to the University of Edinburgh. Entering the Royal Navy as assistant-surgeon in 1807, his first service was in the *Nymph*, which vessel accompanied Lord Gambier's fleet to Copenhagen; and he was in the boats of that ship when they attempted to cut out a French brig, under Belem Castle, in 1808, in which affair Captain Shirley was killed. In consequence of his conduct on this occasion he was made surgeon, and appointed to the *Hercules* of seventy-four guns. In 1809 he was transferred to the *Bombay*, and served in that ship at the siege of Tarragona: afterwards as surgeon to the 1st battalion of Marines he was with Sir G. Cockburn in the operations on the coast of Georgia, and was present at the capture of a fort and the taking of the town of St. Mary's.

In May, 1819, he was selected to accompany the Polar land expedition under Sir J. Franklin. After venturing on the great Slave Lake, the Coppermine River was descended in frail-birch-bark canoes, and the coast of North America explored to the eastward $6\frac{1}{2}^{\circ}$, as far as Cape Turnagain. The record of hardship and privation experienced upon their return voyage will be familiar to most of you,

and nobly did Richardson play his part on this trying occasion. In the introduction, indeed, to the account of the voyage, Franklin pays this tribute to his assistance. "To Dr. Richardson the exclusive merit is due of whatever collections and observations have been made in the department of Natural History, and I am indebted to him in no small degree for his friendly advice and assistance in the preparation of the present narrative."*

In the second expedition of Franklin, 1825 to 1828, to Dr. Richardson was entrusted the exploration of that portion of the Arctic Sea between the Mackenzie and the Coppermine rivers, a distance of 902 miles, while Franklin proceeded along the coast to the westward, and reached a spot within 160 miles of Icy Cape (the limit of Captain Cook's discovery). The geographical results of these two expeditions may be thus summed up:—The exploration and delineation of the northern shore of the American continent throughout 40 degrees of longitude, comprising an extent of coast-line amounting to nearly 2000 miles. But it was not geography alone that was benefited by their labours, for the meteorological and magnetical observations, taken with a faithfulness and perseverance that demands the greatest praise, combined with those collections in the department of Natural History, which, while taking a share in the labour of his companions, were the especial vocation of Richardson, rendered the account of these voyages especially interesting to the scientific world; and the publication of that excellent work, the '*Fauna Boreali-Americana*,' proved how well qualified he was for the position he had been selected to fill. In 1838 Dr. Richardson was appointed Physician, and in 1840 Inspector of Haslar Hospital; in consideration of his eminent services, he was made a Companion of the Bath, and received the honour of Knighthood in 1846.

When in 1848 it became necessary that succour should be sent to his former chief, Sir John Franklin, Richardson again came forward, not only with his valuable advice and experience, but with personal service; and in company with Dr. Rae descended the Mackenzie, and traversed the Arctic shore between that river and the Coppermine, an account of which was published in 2 vols. in 1851. His assistance to the subsequent searching expeditions by the preparation of pemmican and antiscorbutics, and the advice respecting clothing and equipment, were undoubtedly of great service, and possibly the means of saving many lives.

* See Franklin's '*First North-Polar Expedition*.'

After his retirement from active service Sir John settled at Grassmere, and, as will be seen in the list of his works in the foot-note,* took a prominent part in the promotion of science; and after an honourable and useful career, terminated an active life of industry on the 5th of June, in the 78th year of his age, and to the deep regret of his numerous associates in the Royal, Linnean and Geographical Societies, in all of which he was most highly esteemed.

Finally, let me say of my valued friend that all his scientific work bears the impress of his character. It is painstaking, honest, sagacious, and without pretension; a most trustworthy repertory of carefully and intelligently observed facts.

In his official relations, Richardson presented to superiors as to inferiors the same simple dignity, inflexible determination to do what he considered right, and great administrative energy in carrying out that determination. A certain, not inappropriate, Arctic ruggedness coated the exterior of the man, and perhaps interfered with his reaching the highest post which he was eminently qualified to occupy, as occasionally it may have led young and inexperienced juniors to think him cold and unsympathetic. But sooner or later his subordinates found that Sir John had silently taken the measure of their tastes and capacities, and, when an opportunity presented itself, was ready to advance their interest in a spirit of most genial and thoughtful kindness. One eminent naturalist† has told me, that he owed what he has to show in the way of scientific work or repute to the start in life thus given him by Sir John Richardson. In short, by an union of sagacity and energy with a warm heart, he was a fine type, I am proud to say it, of the foremost class of Scotsmen.

DR. BARTH.—By the death of Dr. Henry Barth, the great African traveller, we have lost a distinguished medallist of this Society, and a geographical explorer of world-wide fame. Born at Hamburg in 1821, he died at Berlin in 1865, in his forty-fourth year. Those who wish to trace the detailed progress of this remarkable man

* *List of Works by Sir J. Richardson*.—Fauna Boreali-Americana, 2 vols. folio, 1829 to 1836. Report on North American Zoology, 8vo., 1837. On the Frozen Soil of North America, 8vo., 1841. Zoology of the 'Sulphur's' Voyage (Fish), 1843. Zoology of the 'Samarang's' Voyage (Fish), 1848. Boat Voyage through Ruess's Land and the Arctic Sea, 2 vols. 8vo., 1851. Zoology of the Voyage of the 'Herald' (Fossil Mammals), 1852. Notes on Natural History (Belcher's last of the Arctic Voyages), 1855. Hygiene as a branch of Military Education (in the Transactions of the Social Science Association), 1858. Yarrell's History of British Fishes (new edition), 1859. Polar Regions (in the Encyclopædia Britannica), 1859. Polar Regions, 1861. Museum of Natural History (Glasgow), in connexion with others, 1859 to 1862.

† Professor Huxley.

should peruse the account of his life, as given by Dr. Koner of Berlin. Educated thoroughly in a knowledge of the classical authors of antiquity, he from an early age began to take the deepest interest in African geography, when he read with keen relish the works of our countrymen Mungo Park, Lander, and others. After acquiring the degree of Doctor in the University of Berlin, he made, in the years 1845 to 1847, coast journeys along the southern or African shores of the Mediterranean, a full account of which was afterwards published at Berlin (1849). In 1853 he communicated to our Society an account of his more extensive expeditions; and in 1857, when a resident in London, he completed that masterpiece of all his labours, entitled 'Travels in North and Central Africa,' in 5 vols., being the result of all the researches he had made, when associated with Richardson, with Overweg, with Vogel, and lastly by himself alone and undaunted.

It was for this original work that the Royal Geographical Society awarded to Dr. Barth its highest honour, and placed him in the limited list of its Foreign Associates; for although he made no observations to fix with astronomical accuracy the latitude and longitude of places, the reckoning of the distances he travelled over was so accurately and minutely laid down, and his chronometer so studiously observed, that he was enabled to add much to cartography, whilst his description of the countries he traversed, and the inhabitants he came in contact with, was most telling and effective.

Since that time, following the steps of his eminent countryman, Carl Ritter, Dr. Barth has been the life and soul of the Geographical Society of Berlin, by bringing before that body the accounts of the travels of all African explorers, including Du Chaillu, Speke and Grant, Munzinger, Beurmann, Baikie, Vogel, Duveyrier, Schweinfurth, von der Decken, Gerhard Rohlfs, and others. He also made two journeys in the interior of Turkey, accounts of which are given in the 'Zeitschrift für allgemeine Erdkunde' of 1863, in which work, as in the 'Mittheilungen' of Petermann, and in the volumes of the German Oriental Society, will be found a list of his numerous publications.

The chief work by which Dr. Henry Barth will be remembered is that to which I have already alluded, and which he published under the auspices and by the assistance of the British Government. In it he develops how, by his indomitable perseverance and skilful researches, he was enabled, for the first time, to lay before the world the true character of a vast extent of wide and hitherto untrodden

lands between Timbuctoo and the Niger. It was specially for these labours that we rejoiced to honour him by giving him our medal; and we were equally rejoiced when our gracious Sovereign conferred on him a Companionship of the Bath.* A more intelligent, indefatigable, trustworthy, and resolute traveller than Dr. Barth can rarely be found, and we all deplore his untimely end at the early age of forty-four.

FORCHHAMMER.—John George Forchhammer, who died at Copenhagen on the 14th December last in his 73rd year, was a justly popular and highly esteemed Foreign Member of our body, as well as of the Royal and Geological Societies of London. The son of the Rector of the school at Husun, in Jutland, he studied chemistry and pharmacy at Kiel, under Phaff, afterwards made an excursion to the Harz to see the small smelting-furnaces of Goslar, and subsequently, at the University of Copenhagen, he largely profited by the lectures on physics of the illustrious Oersted. In 1820 he became a Doctor of Philosophy; his inaugural treatise being on the acid and super-acid of manganese. Lecturing continuously, whether on the manufacture of porcelain, or on chemistry and mineralogy, he became, on the death of Oersted, Director of the Polytechnic Institution and Secretary of the Royal Academy of Sciences.

The enumeration of all the original publications of Forchhammer, the greater number of them pertaining to chemistry, mineralogy, and geology, is not consistent with the nature of this Address; but in order to do full justice to the memory of my valued friend, I have handed over to the President of the Royal and Geological Societies an admirable notice of his deeds and accomplishments, prepared at my request by his distinguished countryman, Admiral Irminger, of whose fellowship we are all so proud. Suffice it to say, on this occasion, that Forchhammer's analyses of many simple minerals, as well as of magnetic iron, his treatise on the elements of sea-water, and their distribution in the ocean, the result of 180 analyses, are works of a very high scientific order. The last of these was undertaken to establish the view he embraced, that "sea-water is the result of the reciprocal agency between the washing

* As one of his German biographers implied that Dr. Barth was not adequately honoured in this country, let me remind his countrymen that he received at the hands of the British Government an honour of the Crown which was not obtained for Speke and Grant, although the utmost exertions were made by myself as President of the Royal Geographical Society, as well as by many influential persons, to procure for them also that distinction.

out of different substances from the earth, and their chemical, physical and organic agencies."

Forchhammer first visited England in 1820, and examined our sedimentary formations, then very imperfectly classified, particularly as regarded all the older rocks. In subsequent years he wrote memoirs on the geological structure of his own country, and, what is well worthy of notice, he explained the outlines of the lands of Denmark, by showing to what extent they were due to geological structure and ancient movements, and how far they had been modified since the earliest traceable historical period. His memoir on the influence of sea-plants in the production of alum shale was a first step in a series of publications in which he demonstrated how in the present time, as in former periods, different substances after certain changes revert to their original form and condition. Indeed, several of his other works have the same bearing, viz., "On the minerals in animals and plants of the ocean;" "On the spread of mineral matter through the strata of the earth's crust;" "On the origin of Dolomite;" "On the artificial production of crystals of apatite and magnetic iron," &c. Besides these purely scientific works, he was of great use to his country by showing the relative value of peat and other combustibles, and by establishing good supplies of water by means of Artesian wells.

Making several journeys to England, he travelled in one of them (1837) with Professor Phillips, the present President of the British Association, and as I then made his acquaintance, it afterwards became a source of great gratification, as well as instruction to myself, to cultivate his society whenever I passed through Copenhagen in my visits to Russia between 1841 and 1845 inclusive. It was in his native capital that Forchhammer shone out conspicuously, not only through the high station he had there attained as a man of science, but also by his powerful social influence. Indeed, from the King downwards he was esteemed—nay beloved by every one, and he invariably used his influence to the best possible effect.

Being associated with him in 1844 as member of a great scientific Scandinavian meeting at Christiania, it was my good fortune to make geological excursions with him in Norway; and on these occasions I was forcibly struck with his ability and quickness in accounting for the metamorphism of several members of the Silurian deposits in those tracts where they are in contact with the igneous rocks, which

have changed fossiliferous limestones into white saccharoid marble, sandstone into quartz rock, and shale into crystalline slate. In 1845 he was very servicable to me in explaining the exact relations of several of the Silurian rocks of the south of Sweden (Scania, &c.), which I had just visited. Among many other original views, he called my attention to the proofs in the physical configuration of the coasts of a long line of former subsidence, which passing from Denmark in the north, deepened in its range southwards, if it did not actually form the Straits of Dover. He contended that in all the submarine forests along these shores, the trees which still stood erect, with their roots in their native soil, had nearly all been truncated about two or three feet above their stools—a result, as he justly said, which could not have happened if a gradual subsidence of an inch or two in a century had taken place, as in such case the wood must have certainly rotted and disappeared.

In alluding to my intimate relations with Forchhammer, I must pointedly advert to the cordial and encouraging support which he gave me, in company with his eminent countryman Oörsted, when I presided over the British Association at Southampton, in 1846; neither can I forget how he gratified me by his presence when I lectured in 1849, during the meeting of the British Association at Birmingham, to a vast multitude in the caverns of Dudley.

In summing up his character I must say that I never met with a man who was more truly good and loveable. His bodily powers, as exhibited during a pedestrian excursion, were extraordinary; and he ever enlivened the way with so many illustrations or merry anecdotes that no symptom of fatigue could arise in his company. As a lecturer, he was lucid and persuasive, and ever carried his audience with him.

Honoured by his sovereign, beloved by his countrymen, and occupying the highest position to which a man of science can attain, the body of this eminent and loyal Dane was followed to the grave by persons of every class, all of whom felt that among them no one had been more broken-hearted at the spoliation of Denmark, and the invasion of his native Jutland, than the high-minded and patriotic John George Forchhammer.

NILS NORDENSKIÖLD.—This skilful mineralogist and geologist and close observer of the outlines of the earth, who, on my own motion, was not long ago added to the list of our Honorary Corresponding Members, died on the 21st of February last, near

Helsingfors, in Finland; being then in his seventy-third year. It was especially for his new map of Finland, illustrating his able memoir on the scratched and polished surfaces of the rocks of his native country, that we considered him to be well worthy of the honour we conferred on him. No work, in my opinion, has more thoroughly demonstrated the truth of the conclusion at which I had arrived, and on which I dwelt at some length in my Address of 1864, namely, that during the glacial period great marine currents, transporting masses of drift as well as gigantic icebergs over sea bottoms which have since been raised into lands, have produced striations, flutings, roundings, and polishings, precisely similar to those which result from the advance and passage of terrestrial glaciers. Finland unquestionably was never passed over by a terrestrial glacier any more than was the northern portion of the United States of America; and for his clear demonstration of the fact as regarded his native land, the name of Nils Nordenskiöld will ever be remembered. Professor Nordenskiöld, who made several visits to this country, and attended two meetings of the British Association, was much liked for his unassuming and agreeable manners. His son, Professor Adolf Nordenskiöld, of Stockholm, is well entitled to take the place of his honoured parent for his recent researches in Spitzbergen, and particularly for his excellent map of that country.

Baron Charles Claus von der DECKEN.—The melancholy fate of this high-spirited Hanoverian nobleman, in his endeavour to reach the interior of Africa by ascending the River Juba in a steamer, has been recently brought before you; and no one has more truly deplored this catastrophe than myself, who only two years ago had to offer to him in your name the highest honour which we have to bestow.

Baron C. C. von der Decken was born in 1833, at Kotzen, in Brandenburg, of a family of high rank. His father, Ernest von der Decken, fought, as one of the brave German Legion in the British service at the battle of Waterloo, and afterwards filled several stations of importance at the Court of Hanover during the reigns of George IV., William IV., and Ernest, King of Hanover. In 1816 he married Adelheid von Stechow (who, after his death, married Prince Pless), and by whom he had three children, our traveller being the youngest.

As a youth, Charles von der Decken evinced a strong desire to visit distant lands, whilst the study of history, geography, and mechanics, as well as the construction of maps, gave him much pleasure.

Having entered the Cadet corps at the age of sixteen, he was patronised by the King, and in 1850 entered the Hanoverian army as a lieutenant in the Queen's Hussars. He availed himself of his leave of absence to travel through Europe, and in 1858 he made his first endeavour to penetrate into Africa, but was prevented from advancing across the desert by an attack of fever, which compelled him to return.

In 1860 he quitted the army, and soon after embarked at Hamburg for Zanzibar, it being his intention to join his countryman Dr. Roscher in an endeavour to reach the great Nyassa Lake. The murder of Roscher compelled von der Decken to choose another line of research, and he went in an Arab dhow, accompanied only by his servant Corelli, to Kiloa; but failing to induce carriers to accompany him, he returned to Zanzibar. A second effort was also unsuccessful; for although he then contrived to secure a sufficient escort, his men deserted, and his soldiers mutinied; so that, after penetrating a certain distance, his efforts during three months of much privation were unavailing, though, as shown by his works just published in Germany, he acquired some useful knowledge of the country. Being once more at Zanzibar, in 1861, he projected an expedition to examine the great mountain of Kilimandjaro, to ascertain if the report of the missionaries Krapft and Rebmann was true, who stated that its summit was covered with snow; he induced our countryman, the zealous young geologist, Richard Thornton, who had left Livingstone, to accompany him. The result was, that Thornton constructed a large contoured map of the mountain, determined its mineral characters, and, in conjunction with the Baron, made a vast number of physical observations on altitude, temperature, latitude and longitude, some of which have been published in the last volume of our Journal (vol. xxxv. p. 15). In October, 1862, Charles von der Decken made another and a still more successful effort to complete the examination of the same great mountain, which he then ascended to the height of 14,000 ft., or 6000 ft. higher than on the previous occasion, being accompanied by the astronomer and physicist Dr. Karsten. By this survey the altitude of Kilimandjaro was fixed at upwards of 20,000 feet, and it was clearly proved to be a snow-capped mountain.

Returning to Europe in 1863, having visited the Isle of France by the way, it was in consideration of his distinguished services that we awarded to him our founder's gold medal, whilst the King of Hanover conferred upon him the Guelphic Order.

Thus encouraged, he next resolved to employ his means in fitting out such an expedition as would enable him to ascend far into the interior of Africa, by one of the deepest of the rivers which flow through the Somauli country to the north of Zanzibar and Mombas.

Having been privy to the strenuous efforts he made to construct a large and a small steamer suited to river navigation, it gave me the truest pleasure to afford this distinguished man every possible aid. Thus the vessels constructed at Hamburgh had to be transported in pieces on board a ship to be chartered for Zanzibar; and as at that time the Danish war was rife, it was necessary to obtain a free passport from the Danish Government for the purpose of this scientific expedition. Then, again, it was essential to raise the position of von der Decken in the estimation of the Sultan of Zanzibar, who had an immense respect for the English, but none whatever for a German traveller. Good credentials were therefore obtained from the Foreign Office, and the Duke of Somerset most considerately gave orders that the British naval force at Zanzibar should not only aid him in putting his steamers together, but should assist in getting them over the bar of any river he might wish to ascend.

Having organised a strong and well-selected party of Germans, including Lieutenant von Schiekh of the Austrian navy, Dr. Link, and others, he sent the vessel round by sea, going himself by way of Egypt, chiefly in the hope of inducing the Pasha to allow him to take with him some negro soldiers out of the Egyptian army; but in this he met with disappointment.

Arrived at Zanzibar, and having put his vessels together, he first made a fruitless attempt to enter the River Ozi or Dana, and finally entered the Juba in his larger steamer, the smaller vessel and one of his companions having been lost on the bar of that river. He had, as you know, ascended that stream for about 380 miles, when the fatalities occurred by which the loss of the ship was followed, as we are informed on the testimony of his native followers who escaped, by the murder of this devoted explorer and his companion Dr. Link.

I forbear to enter now upon further details of his life; for full justice can only be done to the memory of my lamented friend in an extended memoir. I now simply conclude by reminding you of the gallant perseverance with which, undaunted by frequent attacks of fever, and the hostility of the natives, he overcame

obstacles, and by two expeditions elicited, for the first time, the true physical and natural history characters of the lofty snowy equatorial mountain of Kilimandjaro; and, lastly, how at great cost he organised such an expedition as no other individual has ever conducted, at his own cost, to Africa. If we consider how chivalrously he resolved to penetrate into the interior by the most difficult of all the lines of research, and one never attempted by any former traveller, magnanimously resolving to "do or die," we must all admire such noble conduct. His affectionate mother, the Princess Pless, and his only brother, plunged as they have been into the deepest distress, would still cling to any shred of hope that he may still be alive, and a captive; but, alas! all persons at Zanzibar who are the best qualified to form a just opinion have no doubt that this high-minded and courageous traveller, as well as his associate Link, are no more. All honour to their memory!

Jacob SWART was for several years our Corresponding Member for Holland, a country whose geographical enterprise and literature place it in a very high rank among the nations of Europe. He was born at Amsterdam, July 17th, 1796, and educated chiefly at Dordrecht and the Hague. At twenty years of age he entered the Dutch Royal Navy, passing a few years in their East India possessions. Returning to Holland, and finding a sea-life distasteful, he resigned his commission, and applied himself vigorously to his favourite study of mathematics, and afterwards became a professor in the Royal Naval School in Amsterdam. Soon after this he associated himself with the ancient house of G. Hulst van Keulen, whose nautical publications, for more than two centuries, have been well known throughout the world, and which, during the early part of its existence, supplied all Europe with charts. Early in life he composed a valuable collection of astronomical and nautical tables, still in great estimation; and these, with several other works of a similar nature, established his claim to acknowledged usefulness. This was recognised by his being appointed to various positions in the administration of naval matters, and to honorary association with many of the excellent Societies which characterise the Netherlands. As a further mark of appreciation of his good services, the King, in 1847, invested him with the Order of the Eiken Kroon. In 1841 he started his excellent nautical review, the 'Verhandelingen en Berigten betreffende het Zeewezen,' &c., which, continued to the present day, contains a vast mass of valuable geographical information, and that especially relating to the East

India possessions of the Netherlands. About this time also he drew up an extensive and fine series of charts of the Indian Sea, which embraced the entire amount of our knowledge of its hydrography. Among others of his very numerous works he drew up a Memoir, accompanying an unpublished journal and map, of the celebrated southern voyage of his famous countryman Tasman, a work of great interest. Employed incessantly and laboriously with many literary and public duties, his health failed in 1863, and he died in his native city, much esteemed, on March 14th in the present year. Our library and Journal have been enriched by several valuable contributions by him.

Capitaine DUPERREY.—Louis Isidore Duperrey, member of the Institute of France, and one of our Honorary Corresponding Members, was born at Paris the 21st of October, 1786. He entered the French navy at the age of sixteen, and in 1811 contributed to the Hydrographical Survey of the coasts of Tuscany. In 1817 he embarked as midshipman in the *Uranie*, and accompanied Captain Freycinet in a scientific voyage round the world. He became Lieutenant in 1822, and in that year set sail from Toulon as Commander of the *Coquille*, in which vessel he made one of those scientific voyages which redound so much to the honour of a nation, returning to Marseilles on March 24th, 1825. The theatre of his explorations was South America and Oceania, and he made during his voyage a large number of observations on the pendulum, which served to demonstrate the equality of the flattening of the two hemispheres and contributed to the determination of the magnetic equator. Geography owes to him also maps of the Caroline Islands and Dangerous Archipelago. He was also the author of several memoirs published in the '*Annales de Physique et de Chimie*,' and in the '*Annales Maritimes*,' &c. &c. The great merit of his labours, particularly those on terrestrial magnetism, gained him admission into the *Académie des Sciences* in 1842. He died in the month of August last.

Admiral Don Eduardo CARRASCO.—This distinguished Peruvian was born in Lima on the 13th of October, 1779, the son of Don José Carrasco, a Spanish noble and rich merchant of Lima. In 1794 he entered the Royal Naval Academy of Peru to study for the naval profession, and in 1800 embarked as assistant "Piloto" on board the frigate *Fuente Hermosa*, being engaged in subsequent years, when not cruising in the Pacific, as one of the naval teachers in Lima. In after years he became impressed with the liberal views then so prevalent, and was one of the first to excite in his native land that

spirit of resistance to Spanish authority which led to the War of Independence. Dismissed from the service in consequence of these opinions in 1818, he devoted himself to the study of medicine, and on the declaration of Independence in 1821 was made by General San Martin Secretary-General of the new Republic. The late Admiral Fitzroy, who visited Peru in the *Beagle* in 1835, testified in his narrative to the information and assistance he obtained from Captain Carrasco, who was then Director of the Naval Academy of Lima. In 1839 Carrasco succeeded his friend Paredes as *Cosmographo Mayor* of Peru, and in 1855 became Rear-Admiral. During these years he completed a map of the confederated republics, by order of General Santa Cruz, and this was then the best map known of these countries. The '*Calendario y Guía de Forasteros*,' which he first published in 1826, was replete with geographical, historical, and statistical information with regard to Peru. Admiral Carrasco was elected honorary member of our Society in 1839, on the recommendation of Admiral Fitzroy. He died on the 16th November last.

Professor KUPFFER.—This distinguished member of the Imperial Academy of Sciences of St. Petersburg was one of our Honorary Foreign Associates, and during many years exerted himself with great pertinacity and perseverance in establishing magnetical observations in various parts of the Russian empire. To the value of these labours General Sabine, the President of the Royal Society, has borne testimony.

Besides his travels to the Caucasus and the Ural, and his descriptions of the structure of those mountains, Professor Kupffer rendered practical service to his country by the publication of his great work '*Poids et Mesures Russes*,' in two volumes imperial quarto, in which every Russian weight and measure has had its equivalent assigned in nearly all the other countries of the world.

Professor Kupffer was much attached to England and often visited our country, and the meetings of the British Association for the advancement of Science were twice attended by him. Among his other numerous works are the following, copies of which are in our Library:—*Recherches Experimentales sur l'Elasticité des Metaux*;' '*Note relative à la Temperature du Sol et de l'Air aux limites de la Culture des Céréales*;' '*Annales de l'Observatoire Central de Russie*,' and '*Annuaire Magnetique et Météorologique*,' both of which serials he brought out for many years, besides the '*Compte-Rendu Annuel*' and volumes of Tables of Meteorological and Magnetic Observations.

The Earl of DONOUGHMORE.—The Society has lost a staunch friend in Lord Donoughmore, who among his varied accomplishments had a true love for geography. Clear headed and anxious to be useful, he was, when not suffering from severe attacks of gout, to which he was subject, of great service in our Council. Every well-wisher to the Royal Geographical Society, and myself in particular, felt much indebted to this high-minded nobleman two years ago, when by his lucid explanation and fervent appeal to a General Meeting, he calmed an irritable feeling existing among a very few of our Fellows, which, if it had spread, would have been highly prejudicial to our well-being. His lordship's capacity for business, his clear elocution, and the weight of his opinions, enabled him to be of great service in his place in Parliament, and his death at the early age of 42 must be considered a national misfortune.

Lord MONTEAGLE.—This accomplished nobleman occupied many prominent public situations, including the Chancellorship of the Exchequer. In early days he distinguished himself in the University of Cambridge, and was through life earnest in supporting every intellectual advance, whether in the fine arts or in science. His name is bound up with many public events of this century which the historian will have to record, but which are foreign to the purpose of this short notice. I have only to add that Lord Monteagle was much beloved and respected by a large circle of friends, including myself, who enjoyed his cheerful, instructive, and agreeable society.

Dr. John LEE.—The late Dr. Lee, so widely known in various circles, was distinguished as an astronomer, and his biography will be most fittingly enlarged upon by the President of the Astronomical Society, of which he was so liberal a patron and formerly President. His name will be probably best remembered in after years by the finely illustrated volume '*Ædes Hartwellianæ*,' which was written by his friend, our late associate, Admiral Smyth, and described the manor and mansion of Hartwell, the seat of Dr. Lee, together with the observatory, which, as I have already mentioned in this obituary notice, was originally the property of the Admiral. In this mansion Dr. Lee dispensed the most ready and hearty hospitality to all his friends, and especially to men of science. He was a man of wide and generous sympathies. For many years I have observed him to be a constant attendant at the meetings of the British Association, where his absence will be much felt. He died in February last, at the ripe age of eighty-one years.

Dr. Thomas HODGKIN.—The late Dr. Thomas Hodgkin, a member of the Society of Friends, who was so widely known as an active philanthropist, belonged for a period of fifteen years to the governing body of our Society, first as Honorary and afterwards as Foreign Secretary, and Member of Council. He was born in Pentonville in 1798, and having adopted the profession of medicine, filled in early life the posts of Demonstrator of Morbid Anatomy and Official Curator of the Pathological Museum at Guy's Hospital. During these years he published various treatises on medical subjects, and distinguished himself as an earnest advocate of projects of medical reform. He was subsequently nominated Member of the Senate of the University of London, on the establishment of that institution in 1836—a post which he continued to occupy till his death. On the death of his friend Dr. Prichard, the eminent author of the 'Physical History of Man,' Dr. Hodgkin read a most interesting memoir of his life before the Ethnological Society (1849). Although he had not achieved a reputation as a geographer or traveller, Dr. Hodgkin made good use of his general scientific attainments and powers of observation during the various journeys to distant countries which he made, in pursuit of the noble philanthropic objects that occupied so large a portion of his attention.* It was thus that, after his return from the mission to Morocco, which he undertook in company with Sir Moses Montefiore, for the purpose of obtaining from the Sultan concessions in favour of the Jewish population, he communicated a paper to this Society, containing his observations on the physical geography of the region. He also made two journeys to the Holy Land on philanthropic errands; and it was whilst on the second of these that he was seized with the illness which terminated his useful life at Jaffa on the 5th of April last.

GEORGE RENNIE.—Among the eminent practical Civil Engineers of our day, my valued friend the late George Rennie stood pre-eminent. The eldest son of John Rennie, whose great engineering works are known in many a country, our deceased member, after an early education in London and its environs, was sent to the land of his fathers; and at Edinburgh, under Professors Playfair, Leslie, Hope, Christisson, and Dunbar, he acquired those sound elements of knowledge which were ever afterwards conspicuous in all his works. After some years of service in the Mint, he went into partnership with his younger brother, the present Sir John Rennie; and thenceforward his career was marked by a continuous

series of important mechanical operations at home and abroad, whether in our dockyards or for the governments of Portugal, Mexico, Peru, Turkey, and Russia. Together with his brother and Mr. C. Vignoles, he laid out the line of the Liverpool and Manchester Railway, as designed by George Stephenson, and, what is remarkable in engineering affairs, the cost of completing this famous work as carried over the Chat Moss was less than the estimate by fifty-seven thousand pounds! If the railway gauge proposed on that occasion by the brothers Rennie had been adopted (*viz.* 5 feet 6 inches) the country would never have been agitated by the controversy of the broad and narrow gauges; for that width, which is in force in Ireland and elsewhere, is now admitted by all parties to be the best.

* It is not for me to enumerate the many other important works of our deceased member. I may, however, say that the brothers Rennie, though not the original inventors, were the first to introduce screw-propellers into the British navy, in 1840, thus producing a great revolution in seamanship and maritime tactics; it being a curious fact that John Rennie, the father, first introduced paddle-steamers into the navy in 1819.

Much of the spare time of Mr. George Rennie was devoted to purely scientific pursuits. As early as 1822, he became a Fellow of the Royal Society, and, in virtue of his sound contributions as published in the 'Philosophical Transactions,' he attained the honour of being the treasurer or second officer of the parent Scientific Society. His Reports, published in the volumes of the British Association for the Advancement of Science, are also standard evidences of his knowledge, and will assuredly secure for him a forward place among the men of science of our age. With these mental qualifications Mr. George Rennie united in his own character the most engaging kindness of manner, so that I can safely affirm that amidst my scientific friends I knew no one who was more generally beloved and respected than himself. He died on Good Friday last, after a long illness brought on some years ago by having been accidentally run over by a carriage.

Dr. William Freeman DANIELL distinguished himself by the ardour with which he pursued various branches of science during a long residence as medical officer on the West Coast of Africa. In 1849 he published a valuable work, embodying some of the results of his experience, under the title of 'Sketches of the Medical Topography and Native Diseases of the Gulf of Guinea.' He also wrote a work

on the copals of Western Africa, and became very favourably known amongst botanists by the success with which he cultivated the economical and medicinal branches of the science, in the countries where he was stationed. On his return from his seventeen years' residence in the pestilential climate of Western Africa, he was, to the surprise of us all, in the enjoyment of robust health; but on his removal to Jamaica, after he had served in the expedition to China in 1860, his constitution gave way, and he returned to England in 1864 completely shattered in health. He died on the 26th of June last, at the early age of forty-seven. Dr. Daniell was member of the College of Surgeons and Fellow of the Linnean Society. His kind disposition, disinterestedness, and fidelity to his friends, endeared him to all who had the advantage of his acquaintance.

Commodore CRACROFT, C. B., died in Jamaica on August 2nd of this year, aged 49. The second son of Colonel Cracroft, of Hackthorne, Lincolnshire, he entered the Royal Navy in the year 1828, was promoted to rank of lieutenant in 1841, and served as flag lieutenant to Admiral Hyde Parker at Portsmouth. Obtaining the rank of commander in 1846, he proceeded to China in command of the *Reynard*, and while actively engaged in operating against the pirates, he added considerably to our hydrographical knowledge of those seas, but was unfortunate enough to lose his vessel on the Pratas shoal. During the Russian war he served with Sir H. Keppel in the *St. Jean d'Acre*; and subsequently, in command of the *Gorgon*, he took part in the reduction of Bomarsund. In 1854 he was appointed captain of the *Niger*, and proceeding in that vessel he took a prominent part in quelling the first Maori insurrection in New Zealand, and was the means of rescuing a party of volunteers and many colonists from destruction by the natives. For these services he was nominated a Companion of the Bath, and in 1863 he succeeded Commodore Dunlop in the command at Jamaica, where he unfortunately fell a victim to fever after a few days' illness.

In addition to the persons whose names have been already mentioned, the Society has to regret the loss of the following Fellows:—Mr. M. W. Atwood, Mr. R. S. Black, Mr. George Bower, Mr. J. G. Cole, Mr. G. Wingrove Cooke, Viscount Cranbourne, Mr. R. H. Davies, Colonel the Honourable A. Egerton, Mr. F. Goldsmid, Mr. Christian Hellmann, Mr. W. H. T. E. Huskisson, Captain H. J. Hartstene, the Rev. C. C. Hill, Mr. G. F. Heneage, Mr. F. N. Isaac, Mr. Pliny Miles, Mr. E. Markham, Captain P. Maughan, Rev. C. Oakley, Mr. Benjamin Oliveira, Mr. Henry Reeves, Mr. J. A.

Olding, Colonel C. Sim, Major W. H. Sitwell, Mr. Robert Sweeting, Mr. A. Spottiswoode, Mr. H. F. Southey, Mr. Franklin Travers, Mr. F. Verbeke, General Sir E. C. Whinyates, K.C.B., and Mr. Robert White.

Several of these noblemen and gentlemen were distinguished for their acquirements, though no one of them, as far as I know, has contributed directly to the advance of Geographical science. One of them, however, the late Mr. Benjamin Oliveira, formerly a member of Parliament, deserves grateful notice on our part, inasmuch as he has bequeathed a sum of money, the exact amount of which is not yet ascertained, to increase the funds of the Royal Geographical Society.

ADMIRALTY SURVEYS.—The following resumé, as drawn up by the Hydrographer,* will show the progress which has been made in the various surveys carried on under the direction of the Admiralty during the year which has just passed.

Although from various causes, which could not have been foreseen or guarded against, the Hydrographical Survey has in some parts of the world fallen short of the average amount of work performed during preceding years, yet in other cases it has been very much exceeded; and on the whole we may fairly consider that the efforts of those engaged in these onerous and often trying duties have been as successful as could have been desired or expected.

The modified system in regard to the home surveys alluded to in the report of the year 1865 is now in full operation, and the introduction of a new element into our foreign surveys, by appropriating a small ship of war on the principal naval stations to auxiliary or occasional surveying duties, has been carried out in China and North America with a fair prospect of success.

Not the least gratifying feature of this report is the increased interest which has been taken in geographical and hydrographical subjects by naval officers generally, as evinced by numerous, and in many cases important, remarks as well as plans received from them, and which may perhaps in some measure be fairly attributed to the liberal supply of charts which is now dispensed by the Admiralty to officers of all grades in her Majesty's ships.

Coasts of the United Kingdom.—Captain E. J. Bedford, with his three

* Captain Richards, R.N.

assistants in the *Lightning*, have been employed in completing the soundings off the western coast of Scotland and the Hebrides, and have made a careful re-examination of the Sound of Mull, with additions and corrections to various parts of the coast.

This vessel is for the present removed to the south-western coast of England, and has commenced a re-survey of Cardiff Roads and the neighbourhood, rendered necessary both in consequence of the changes which have taken place in many of the banks since the last survey by Captain Beechey in 1849, and of the vastly increasing commerce in the ports of the Bristol Channel.

Staff-Commander E. K. Calver and his party of three have completed a thoroughly new and excellent survey of the Downs, and have also entirely resurveyed Yarmouth and Lowestoft Roads, including the coast between Winterton and Southwold. Both of these works were much required, owing to the very considerable shifting of the banks which had taken place, especially on the shores of Suffolk.

Commander Brooker has been employed with a steam launch in the neighbourhood of Spithead and the Bar of Portsmouth Harbour, where the constant attention of a surveying officer is required to watch and record the changes which are taking place, owing to natural and artificial causes; he has re-surveyed part of the Medina River at Cowes, where marked improvements have been made by dredging and buoying.

The Channel Islands survey, under Staff-Commander John Richards and Mr. W. B. Calver, Master, has progressed very favourably, and the eastern and western coasts of Jersey, with numerous soundings, have been added to the southern shores of that island, which part was surveyed last year. New Sailing Directions for Jersey have also been prepared by the former officer, and published by the Admiralty.

Foreign Surveys.—The Mediterranean surveys under Captain Mansell in the *Hydra*, and Commander Wilkinson in the *Firefly*, with their respective assistants, have made very good progress during the past season. Captain Mansell has minutely surveyed the western coast of the Morea from the Gulf of Patras to the eastern shore of the Gulf of Kalamata, together with several plans of anchorages. The whole of the Morea may now be said to be very fairly charted, although it will be desirable, when more important work is completed, that some additional soundings should be obtained and a re-examination of the shore made between the Gulf of Kalamata and Cape Matapan. Captain Mansell has retired from his long

and useful labours, after a period of thirty-two years passed in the surveying branch of his profession, and has been succeeded by Captain Shortland in the command of the *Hydra*.

Commander Wilkinson during the past season has completed the coast of Tunis from Cape Bon to the southern part of the Bay of Kabes, with its off-lying islands and shoals, also the Gulf of Tunis, with plans of the anchorage off the Goletta, and the Bay of Hammamat; he has likewise completed the western coast of Sicily from the Gulf of Castel-a-mare on the north to Cape St. Marco on the south; disproved by numerous soundings the existence of the Fox Rock off the south coast of Sardinia, which had so long been a source of anxiety to navigators; made plans of the anchorages on the south coast of that island, and added considerably to the soundings in the Malta Channel. The *Firefly* has now been withdrawn from the Mediterranean survey, which will henceforth be carried on by the *Hydra* alone.

China and Japan.—The *Swallow* and *Dove*, under Mr. Edward Wilds and Mr. George Stanley, Masters, have been very profitably employed in Northern China; having completed the examination of the Shantung Peninsula and surveyed a considerable portion of the western coast of the Island of Formosa, sounded the channels between that island and the main, and added very materially to the soundings generally in the northern portion of the China Sea between Hong Kong and the Corea. The *Swallow*, having completed her time, is on her passage to England.

The *Rifleman*, under Commander Ward, has added something to our knowledge of the reefs in the main route to China, and has resurveyed Victoria Harbour in the Island of Labuan.

The *Serpent*, Commander Bullock, performing in addition to the duties of a ship of war, those of an auxiliary surveying-vessel, and attached to the squadron of Vice-Admiral King in China, has already contributed much useful information; consisting of soundings and observations on the currents on L'Agulhas Bank, the rectification of the positions of doubtful dangers at the western entrance of the Java Sea, a correction of the survey of St. Paul's Island in the Indian Ocean, a plan of the entrance of Bruni River in Borneo, as well as various soundings in the Palawan Passage and China Sea.

Colonial Surveys.—*Nova Scotia.* The survey of the coasts of this colony has been brought to a close by Commander P. A. Scott, who was materially aided during the past season by Captain Hamilton of the *Sphinx*, in obtaining the soundings at the entrance of the Bay

of Fundy and off the south-east coast; a service requiring much judgment, and not unattended with risk, on a coast almost continually enveloped in fogs and subject to strong and uncertain currents. Additional soundings are still required in the Bay of Fundy, which will be obtained, during the short intervals of favourable weather which present themselves in September and October, by one of the squadron under Sir James Hope.

Newfoundland.—This important survey is progressing favourably under Mr. J. H. Kerr, Master R.N. During the past year he has surveyed Random and Smith Sounds and other portions of the west side of Trinity Bay; thus completing the whole of that bay to Cape Bona Vista.

West Indies.—Mr. Parsons, Master R.N., who is conducting this survey in a small hired vessel, has completed during 1865 the survey of the island of Tobago; and Commander Chimino, in H.M.S. *Gannet*, has commenced and almost completed the whole of the Gulf of Paria, with a considerable portion of the coast of Trinidad; in both of which great discrepancies were found to exist in the present charts.

British Columbia.—Mr. Pender, Master R.N., in charge of the survey in this colony, has, with his two assistants, surveyed the extensive estuary known as Knight's Inlet, with the many channels and passages leading into it from Queen Charlotte Sound, Broughton and Johnstone Straits. The islands are so numerous and the coasts so much broken that although it is not more than 70 miles from the entrance to the head of the inlet, yet its shores comprise an extent of coast-line amounting to upwards of 700 miles.

The entrance of Smith Sound to the north-westward, and immediately to the northward of the north point of Vancouver Island, has also been examined, and an excellent and convenient harbour discovered; thus the whole of the mainland of British Columbia, from its southern boundary in the parallel of 49° N. to the entrance of Fitzhugh Sound in $51^{\circ} 20'$, is now accurately laid down on our charts; probably the most intricate and broken stretch of coast in the world. The survey is progressing northward to our northern boundary in $54^{\circ} 30'$ N., and the recent discovery of good coal in Queen Charlotte Island has rendered it necessary that a portion of the shores of that island should at once be examined.

South Africa.—Mr. W. Stanton, Master R.N., who succeeded to the charge of this survey in March, 1865, has already made rapid

progress with the examination and charting of the coast; having completed from Cape Infanta to Izervack Point, a distance of 60 miles, and from Cape St. Francis to Recife Point, a further distance of 68 miles. Owing to the exposed character of this coast the difficulties of obtaining the soundings are very great; but during the past season Mr. Daniel May, Master R.N., the chief-assistant, and for some time in temporary charge, was enabled to sound a considerable portion of the coast, through the assistance rendered him by Commander C. Jago of H.M.S. *Rapid*.

New South Wales.—Commander Sidney and his two assistants have been very successful during the past season, and have completed the coast of New South Wales, from the Solitary Islands to Point Danger, the northern boundary of the colony; and where the work has been satisfactorily connected with the Queensland Survey brought southward from Moreton Bay. They have also commenced a resurvey of Port Stephens, and have surveyed the coast from it northward to Sugar Loaf Point. The remaining portion of the seaboard of the colony, from Sydney southward to Cape Howe, now requires to be rectified, to place it on the same footing of accuracy with that already accomplished to the north; and arrangements are made to carry out this desirable object.

Queensland.—Staff-Commander Jeffery and his assistant Mr. Stanley, Master R.N., have completed the survey of the northern entrance to Great Sandy Strait; have connected the southern boundary of the colony with Commander Sidney's work at Point Danger; and are now employed in examining the coast between that point and the northern extremity of Moreton Island.

In the examination of this portion of Queensland, much assistance has been rendered by Commander Nares in the *Salamander*; this vessel is specially employed on the coast of Queensland in connexion with the semi-Imperial establishment at Cape York, and her commander loses no opportunity of adding to our hydrographical knowledge of that magnificent channel, known as the Inner Passage, leading from Australia to our Indian possessions; and along the shores of which (owing in a great measure to the energy and perseverance of that intelligent and enlightened geographer Sir George Bowen, the Governor of the Colony) colonization is spreading so rapidly as already to have reached the head of the Gulf of Carpentaria.

There is every reason to believe that at no distant day there will

be regular steam-communication to India and England through this Inner Passage.

The *Salamander* is at the present time engaged in making an examination of the eastern and southern shores of the Great Gulf of Carpentaria.

Victoria.—In this colony Commander Cox, with his staff, has completed, on a very elaborate scale, the harbour of Western Port, and has surveyed the intervening coast between it and Port Phillip.

South Australia.—The survey of the coast of this colony, at present under the temporary charge of Mr. Frederic Howard, Master R.N., was transferred more than two years since, at the request of the local Government, to the north-western portion of the territory, in connection with the establishment of a new settlement in the neighbourhood of the Adelaide River. It was hoped that ere this Mr. Howard and his party would have returned, and resumed the much-to-be-desired examination of the southern coast; but, owing to the ill success which has hitherto attended the efforts to establish this new settlement, the little surveying-vessel *Beatrice* has been chiefly employed in reconnoitring the neighbouring coasts of Port Darwin and the Victoria River; and, indeed, in attending upon and carrying provisions and stores for the colonists. Thus, although the surveying officers and their crew have worked with the greatest energy and zeal, and have suffered very many privations, we have little to show for their labours during the last two years in the way of charts or hydrographical information of value to the navigator. What could be done, however, has been done. Adam Bay, the site of the settlement, has been surveyed; casual reconnaissances have been made of Melville Strait, Van Diemen's Gulf, and the western shores of the Gulf of Carpentaria, together with soundings wherever they could be obtained.

It is much to be desired, and it is expected, that the *Beatrice* will very shortly resume the more important work originally assigned to her on the southern coasts of Australia.

To sum up the actual results of the labours of the Hydrographic Department, on shore and afloat, it may be stated that sixty-three new charts, including portions of almost every part of the globe, have been published during the year 1865. Among them a chart of the southern hemisphere on the Polar Projection, illustrative of the ice-drift during the different seasons; and showing to what extent the great circle or composite routes between the Cape of Good

Hope, Australia, and Cape Horn, may be ventured on with safety. This chart has been carefully compiled from the observations of all the Antarctic navigators since the time of Cook; and, from the valuable papers on icebergs in the Southern Ocean by Mr. Towson, as well as documents from the Meteorological Department of the Board of Trade, additions and corrections have likewise been made to 1200 original plates. The number of charts printed has been 169,000. A new book of Sailing Directions has been published for the west coast of Hindostan, and new editions have been brought out of the West India Pilot, Part 2; South American Pilot, Part 2; East Coast of Africa; and the Island of Jersey; together with the annual tide-tables, lighthouse books, pamphlets, hydrographical notices, &c.

It is gratifying to add to this brief sketch of the labours of our Naval Surveyors, that many useful contributions have been received during the past year from officers engaged in the regular branch of the naval service; and especially from the squadron under Admiral Sir James Hope, G.C.B., in North America and the West Indies; and it is due to Captain Hamilton of the *Sphinx*, Mr. Dathan, Master of the Admiral's flag-ship, Mr. Cavanaugh, Master of the *Cordelia*, and Mr. Dixon, of the *Rosario*, to remark that they stand prominently forward among the many who have shown an interest in geographical research. Commander St. John of the *Opossum*, while engaged in seeking out the haunts of the Chinese pirates, has never omitted an opportunity of turning his talent for hydrography to good account; and we are indebted to him for the greater part of the knowledge we possess of the shores of the great Island of Hainan, in the Gulf of Tongking, as well as many others of the less frequented parts of the coast of China.

To Mr. Tilley, Master R.N., in command of Bishop Patterson's missionary yacht the *Southern Cross*, we are also much indebted for valuable remarks, as well as plans of many of the islands in the little-visited portion of the South-West Pacific.

It will have been noticed that the *Firefly*, Commander Wilkinson, has been withdrawn from the Mediterranean, and that the *Swallow*, Mr. Wilds, is on her way to England from China; it is by no means, however, in contemplation to reduce during the ensuing year the force engaged in surveying operations. In China, the Corea, Japan, and among the islands of the Eastern Archipelago, there exists, and will exist for a long time to come, a wide field for geo-

graphical and hydrographical research; and it is proposed to replace the *Swallow* by another vessel specially prepared for this service.

It is also the intention of the Admiralty to send a vessel to re-survey the Strait of Magellan, and to examine those remarkable inland channels which, extending nearly 400 miles along the western side of South America, enable large steamers to enter the Pacific in a comparatively low latitude and tranquil sea, and thus avoid the boisterous region of Cape Horn, with its storms and icebergs. Geographers will not fail to remember that Patagonia and Tierra del Fuego have been the scene of the labours of some of our most eminent explorers and surveyors, but natural causes produce changes more or less affecting navigation on most coasts, and the requirements of the seaman keep pace with the march of time.

Moreover, the rapid strides which science and art have made within the last quarter of a century demand that the improved means and appliances which they have placed within our reach should be turned to account for the improvement of navigation, and the consequent advancement of commercial enterprise and prosperity.

METEOROLOGY.—I invite with much satisfaction your attention to the Report of a Committee appointed to consider certain questions relating to the Meteorological Department of the Board of Trade, which I consider to be one of the most valuable documents ever laid before Parliament and the public in the form of a Blue Book, whilst it must be peculiarly interesting to all geographers. Upon the lamented death of Admiral Fitzroy a correspondence took place between the Board of Trade and the Royal Society respecting the future conduct of the Meteorological Department; and a Committee, formed in consequence, and consisting of our associate Mr. Francis Galton, Commander Evans, R.N., and Mr. T. H. Farrer, have prepared a clear account of the best measures to be taken to procure meteorological statistics of the ocean, or as respects weather telegraphy, in or affecting the British Isles.

In the numerous observations made at sea, and collected first by Maury, in 1852, and in the suggestion during the same year by Sir John Burgoyne, to establish meteorological stations on land, we mark the rise of a new branch of meteorological statistics. Through the subsequent co-operation of the Royal Society and its President General Sabine, as well as by the recommendation of a Congress held at Brussels, this system was brought into operation under

the Board of Trade with Admiral Fitzroy at its head. That eminent man commenced by carrying out the wishes of the Royal Society, but in the sequel was overpowered by the enormous accumulation of materials collected at sea through the united efforts of the naval and mercantile marine of Britain, and the registering of all these data was abandoned. The Committee urgently recommend the resumption of the registering of all the meteorological observations made at sea, and describe the best methods to be followed in extracting observations.

It further appears that much remains to be done in completing the desiderata pointed out by the Royal Society relating to barometric pressure, aqueous vapour, temperature of the atmosphere and surface of the sea, temperature, direction, and velocity of ocean currents, and limits of the trade winds and monsoons. Good practical suggestions are offered in relation to the works now in progress or to be executed, and as to the method of tabulating and publishing the results of meteorological and other observations useful to navigation.

After giving a sketch of the history of the foretelling of storms by means of telegraphing the state of the weather at great distances, as practised so successfully to a great extent by Admiral Fitzroy in this country and in foreign countries by Le Verrier, Dové and others, and after pointing out the great difference between the power of foretelling great occasional storms and the uncertainties of daily forecasts, the Committee use these words:—"The practice of issuing daily official notices of the weather, the truth of which is warranted neither by science nor by experience, is inconsistent with the position and functions of a Government Department, and must be prejudicial to the advancement of true science."

On the other hand, they advocate the continuation of the publication of telegraphic reports and remarks, and the issuing of storm warnings. Respecting the latter it is believed that, so far as they indicate the force of the wind, they are sufficiently correct to be of some value; but that, so far as they indicate the direction as combined with the force of wind, they are not sufficiently correct to be of real value. It is anticipated, however, that more accurate observation and more careful use of the materials already on hand may, at some future time, lead to a more successful result in these popular warnings.

Adopting the recommendation of the President and Council of the Royal Society, that stations shall be established for self-recording observations, and after a minute and detailed analysis of all the

means to be employed and the expenses to be incurred, the Report concludes in these words which have much gratified me. "If a more scientific method should hereafter succeed in placing the practice of foretelling weather on a clear and certain basis, it will not be forgotten that it was Admiral Fitzroy who gave the first impulse to this branch of inquiry, who induced men of science and the public to take interest in it, and who sacrificed his life to the cause."

In regard to the broader subject of weather-changes in all parts of the world, I cannot do better than extract one of the final passages of this able Report, as being of great interest to geographers.

"Considering (say the reporters) the wide extension of civilization and of British colonization and influence, it seems only reasonable that we should possess some regular record of the broad peculiarities of all the great weather-changes that affect the globe. A knowledge of the various regions of exceptional drought, of wet, of heat or of cold, of the deflection of normal currents of air or of the sea, of the variation of the limits of the polar ice, and other phenomena is required; and for this purpose much more of course will be needed than either the ocean statistics or the weather-changes in and near the British Isles, which form the special subjects of our recommendation. We look forward, however, to the establishment, at no distant period, of a regular record of the weather-changes over the greater portion of the globe, through international effort, and especially by means of the observations of British subjects on shore and afloat." *

NEW PUBLICATIONS.—The new publications of a geographical nature which have appeared during the year in this and in other countries, are, as in previous years, too numerous for me to pretend to pass

* The general conclusions arrived at by the authors of the Report are to the following effect:—

1. The collection of Observations from the captains of ships to remain with the Board of Trade.

2. The digesting and tabulating Results of Observations not to continue under a Government Department, but to be wholly under the direction of a scientific body,—such as a Committee of the Royal Society or of the British Association.

3. The procuring and sending daily telegrams and the issuing of Storm-warnings to be under the charge of the same body.

4. For these purposes an annual vote of 10,500*l.* would be required to be granted, on the condition of rendering a yearly account and report to Parliament, leaving to the scientific body entrusted with it perfect freedom in their method and in their choice of labour.

5. The existing Observatory of the British Association at Kew, with the addition of a small branch establishment in London, might be easily developed to carry this scheme into effect.

them all in review, however briefly. The 'Mittheilungen' of our honorary associate Dr. Petermann has appeared during the last twelve months with its usual regularity, and has contained, besides a number of original memoirs and illustrative maps, a *resumé*, from time to time, of current geographical literature. This repertory of valuable information must necessarily be consulted by all who make geography their study.

With regard to other works published on the Continent, I shall presently make mention of M. Pauthier's edition of 'Marco Polo,' one of the most important books of the year. Another work of much interest, relating to Asia, has appeared from the pen of Dr. Bastian, entitled 'Die Völker des Östlichen Asien in Studien und Reisen,' the result of five years' researches in Eastern Asia. Dr. Bastian is known to us as having contributed a memoir to the last volume of our Journal, on the ruined cities and buildings of Cambodia, and has devoted himself with great ardour and conscientiousness to this line of research. The work here mentioned is to extend to five volumes, two of which have now been published.

In our own country, the appearance of several books of travel and geographical works, richly illustrated in chromo-lithography, seems to me to be well worthy of notice, as I have often had occasion to express my regret that valuable series of drawings sent home by travellers should remain unavailable, owing to the cost and difficulties of publication. Amongst this class of works issued during the past year by Messrs. Day and Son, is a volume on Madagascar, by our associate Lieutenant Oliver, containing many coloured illustrations, which convey a vivid idea of the scenery and people of this interesting island. Baines' Views of the Victoria Falls have also been published, and the same firm have now in preparation a fine series of views on the Niger by Mr. Valentine Robins, which were exhibited lately at one of our meetings, and Gully's magnificent sketches of mountain and glacier scenery in New Zealand, sent to this Society by Dr. Haast, and commented upon in my Address of 1864.

During the year two parts of the new edition of Fullarton's 'Imperial Gazetteer of England and Wales' have appeared; a work containing many plans of cities and towns, as well as numerous excellent maps, which must render it of the highest utility. A supplement to 'Blackie's Imperial Gazetteer' has also been lately published.

Lastly, amongst the works which have appeared in our own

country, I must mention the volume of 'Sailing Directions for the Indian Ocean,' from the pen of the accomplished geographer Mr. A. G. Findlay; a work in which is stored an immense amount of hydrographical and geographical information, and a worthy continuation of the series of books of a similar nature which the author has published.

Marco Polo and Mediæval Travellers to China.—Whilst our associate Colonel Yule has been occupied during the last year in producing a work on mediæval travels to China, for publication by the Hakluyt Society, an abstract of which has been recently sent to us for reading before our own body, M. Pauthier, the well-known Oriental and Chinese scholar, has brought out in Paris a work which must be highly interesting to all comparative geographers, under the title of 'Le Livre de Marco Polo.'* By publishing for the first time the original manuscripts in the old French of the 13th century, which have long lain in the National Library of Paris, and which were dictated by the great traveller in his prison at Genoa to his secretary Rusticiano di Pisa, M. Pauthier has done much to establish the fidelity of the narrative. Whilst the man of letters will luxuriate among the copious illustrations of the subject, whether in notes and commentaries, or in the references to a multitude of authors, who, besides our gifted countryman W. Marsden, have written upon Marco Polo, as well as in the supplemental historical chapters attached to this work, it is to the map especially of M. Pauthier that I would direct your attention. This map has great merit, both from its clear definition of the main physical features of the vast regions travelled over by the Commissary and Envoy of the great Mongolian Emperor Khubilai Khan, and also from having the names of the countries and places which were in use at that period, inserted in red letters, alongside of their present names as given in ordinary type. One of the main points of M. Pauthier is to show that the most reliable version of the travels of Marco Polo is that which was written in the French of the 13th century, then the language of chivalry and poetry, and which was corrected by the traveller himself. For, if the narrative was first given in the Venetian dialect, the Italian versions were, it is thought, taken from the old French manuscripts which in that age passed through the courts of France

* 'Le Livre de Marco Polo, citoyen de Venise, Conseiller privé et Commissaire Impérial de Khoubilai Khan, rédigé en Français par Rusticien de Pise,' &c. Paris. Firmin-Didot Frères. 1865.

and England, in which the romances of this very Rusticiano di Pisa were in vogue.

Leaving this critical question to be settled by scholars, we as geographers must hail with satisfaction this accession to the illustrations of the travels of Marco Polo, the Paladin of explorers, who not only first broke through the clouds of ignorance of the middle ages respecting the various countries of the earth, and prepared the way for the discoveries of Columbus and Vasco de Gama, but who also brought from China the first types of printers. What then would have been the admiration excited if in the lifetime of the illustrious Venetian, instead of having his story recited from scarce manuscripts, it had then, or shortly after, been circulated through Europe with the types of a Gutenberg and a Caxton.

Let us therefore applaud the words of M. Walckenae, quoted by M. Pauthier, who has said that of the three men who in the grandeur of their discoveries have most contributed to the progress of geography or a knowledge of the globe, the modest name of the Venetian traveller may well be placed in the same line as that of Alexander the Great and Christopher Columbus.*

EUROPE.—*Eruption near Santorino*.—Our attention has recently been awakened to one of those sudden outbursts of volcanic matter which in the most ancient historical times have actually produced certain islands in the Ægean Sea, the largest of which is Santorino, or the ancient Thera. That island and the adjacent isles of Therasia and Aspronisi are simply segments of the former rim—the now broken edge—of one stupendous volcano, the crater of which is six to seven miles in diameter, and has been for ages a deep sea-bottom. From time to time a central portion of this vast crater has been subjected to renewals of this volcanic activity, and of these this Society was furnished sixteen years ago with abundant proofs in the able account given by Lieutenant Leycester, R.N., as published in the 20th volume of our Journal.† Referring back to Pliny, Strabo, and others, for the accounts of the earlier eruptions and subsidences,

* I must not omit to mention that a most valuable article on M. Pauthier's work has just appeared in the French 'Journal Asiatique' (for April—May, 1866), from the pen of M. Khanikof, a man who is admirably qualified to illustrate the routes of Marco Polo in Persia and the western part of Central Asia. The article is of some length, and written with peculiar clearness and force. This learned Orientalist seems to me to have clearly established the site of all the localities visited by Marco Polo in these countries, and to have thus contributed to remove our ignorance of the state of Persia and Central Asia in the thirteenth century.

† See also a full account of the phenomena in Lyell's 'Principles of Geology,' 9th edition. pp. 441 *et seq.*

he acquaints us that the tract remained in a state of quiescence for upwards of seven centuries, when the volcanic forces became again active in 1457, and were renewed in 1573 and 1650. After this last date all was tranquil in and around Santorino for fifty years: its vineyards were once more prolific, and the older inhabitants only could recollect the terrestrial revolution, when in the year 1707 the little island of Neo Kaimeni, to the west of Santorino, and lying between the Palæo and Mikro Kaimenis of former eruptions,* arose from the sea to the height of about 250 feet, and having the circumference of about a mile. At that time the surface was more or less disturbed at and around this spot for six years, and the action terminated in 1712 only. The dark-coloured insular rocks of the Kaimenis or Burnt Islands, thus formed, proved an inestimable advantage to the natives, in affording safe ports inside the grand old crater of Santorino.

It is just at this locality that the recent changes have occurred by which one newly-elevated mass of rock, composed of scorix and lava, has been added to the island of Neo Kaimeni, which has partly subsided, whilst another small island has been formed. Geologists might certainly have well speculated on the renewal at any time in this locality of such a phenomenon as that which has excited so much attention, not merely by looking back to historical records, but simply by the knowledge we have long had that the sea-bottom on this particular spot, the Bay of Exhalations, where the last changes have taken place, has been for many years affected by the emission of mineral springs containing sulphuric acid gases, which, oozing out in a natural harbour, the sides of which were formed by erupted masses, have rendered this anchoring-ground a bath in which the foul copper bottoms of ships have been in a short time cleansed of their impurities.

The antiquary will find in the account of Lieut. Leycester the description of the various temples and monuments of Greek art which were mutilated and destroyed by the former changes of the land, arising from eruptions and their concomitant earthquakes; but the chief point to which I wish to direct your notice is that the oldest eruption which has ever occurred on the site of this occasional vent of volcanic activity was on an infinitely grander and more colossal scale than any which have succeeded to it, and also

* The first of these rose in the year 197 before Christ, the second in A.D. 1573, and this has still the remains of an old crater. Another island appeared on the north-east coast of Santorino in 1650, but soon disappeared.

that each succeeding outbreak in this crater has been milder than its predecessors. These facts sustain a view which, as an old geologist, I have long entertained, namely, that the subterranean forces which anciently affected the surface and changed the outlines of the earth were of a more intense nature than those which now prevail. This view is countenanced in the region of extinct volcanoes of Asia Minor, and in the grand primeval outflows of Etna or the former activity of Vesuvius when its showers of pumice and ashes destroyed Pompeii. By comparing these with all subsequent outbursts of these several volcanoes, to say nothing of the volcanoes of Auvergne and the Rhine, which have been quiescent during the whole historic era, we see how the activity along visible vents of eruption has successively diminished.

The special interest, therefore, connected with the appearance of these new islets in the Ægean, is that they are miniature and feeble evolutions of the forces which were employed on a gigantic scale in those antehistoric periods when submarine deposits were raised into continents and vast tracts of land were submerged, in some cases by gradual operations working during countless long periods, in others, as I believe, by sudden and spasmodic elevations and subsidences. The geographer, antiquary, and geologist are all equally interested in studying these changes of the earth's outline; and hence it is that such a truly classic work as that of our associate Capt. Spratt on Crete, or the memoir on Santorino by Lieut. Leycester,* to which I have referred you, must be so highly prized by every one who is embarked in such studies.

In addition to the accounts of the last eruption in the Ægean Sea, as forwarded to us by the Earl of Clarendon, including the despatches of the Hon. E. H. Erskine, H.M. Minister at Athens, the description and drawings of M. Schmidt, a despatch of our associate Captain Brine, R.N., and others, the letter of M. Fouqué to the Eparch of Santorino, which was last received, is the most important to us as men of science. Sent thither by the French Academy of Sciences, and accompanied by a member of that body, my old associate M. de Verneuil, M. Fouqué has confirmed the view which I had already taken regarding the comparative feebleness of this eruption. Instead

* Lieut. Leycester wrote his sketch when serving under our accomplished associate, that sound naval surveyor Capt. Graves, of H.M.S. *Volage*; and the map to illustrate the paper is by Lieut. Mansell of that vessel. The subject of the recent eruption has been fully discussed by the French and Prussian geographers, and, doubtless, the full report of M. Fouqué, when published by the Academy of Sciences will be very instructive.

of being a cause of dread and fear to the inhabitants, this escape of the pent-up steam and sulphureous gases, through two small orifices and a fissure which unites them is, he justly considers, a safety-valve of great advantage to Santorino; and that a proper equilibrium being thus established between the volcanic materials beneath the surface of the earth and the atmosphere, the earthquake shocks to which the surrounding region is subject will be diminished. Following out the views of M. St. Claire Deville, M. Fouqué shows, that the intensity of volcanic eruptions is always to be measured by the nature of the materials and gases emitted; and judging from what he has collected at Neo Kaimeni, as compared with the emissions of Etna and Vesuvius, he places this recent event in the *Ægean* in the least active of his four phases of intensity of igneous action. Another important observation of M.M. Fouqué and De Verneuil, showing the very local character of this eruption, is that it has produced no change of level in the land of the adjacent islets of Mikro Kaimeni and Palæo Kaimeni, nor even on the northern part of Neo Kaimeni itself.*

It is right, however, to state, that in a despatch to the Earl of Clarendon, Mr. Consul Lloyd, who differs from some of the views of M. Fouqué, informs us, on the distinct authority of the Commander of a Prussian surveying vessel, that the channel between Neo Kaimeni and Palæo Kaimeni, which formerly had a depth of more than 100 fathoms in the deepest part, has now only a depth of 50 fathoms; and Mr. Lloyd further suggests that as the isle of Aphroessa is increasing, this depth will still more diminish near it, as well as in the waters near the George Promontory. All the phenomena have indeed been elaborately developed by a Greek Commission and Commander Palaska; whilst the best map representing the recent changes has been published by Petermann. As it had been a matter of doubt among some geologists whether flames ever issued from terrestrial volcanos, the well-ascertained fact of real scientific interest attached to the recent evolutions of Santorino is the proof they have afforded of the undoubted presence of flames, whether issuing from the crater or through the cracks and fissures in the newly raised scorix.

Switzerland.—Our excellent Corresponding Member Mr. J. M. Ziegler has this year sent me his usual report of the progress of the Swiss surveys, and with such fulness of interesting detail that it

* A translation of this interesting letter of M. Fouqué will be published in the 'Proceedings.'

would well deserve more space than I can give it in this Address. The great Federal topographical map was finished last year, and the Swiss Geodetical Commission is now taking an active part in the measurement of a meridional arc, entrusted to the International Geodetical Board by different Governments of the Continent. Another task of the Commission is the verification of heights, the determination of the elevation of the Pierre du Niton (Geneva), by successive levelling from Marseilles, having rendered it incumbent on their part to verify the difference of altitude between the Pierre Niton and the Chasseral, or determinating height of the Swiss survey.

The hypsometrical map of Switzerland, compiled by M. Ziegler, and published this year at Winterthur, is remarkable for the clear way in which heights are represented by tints, and gives the latest and most accurate view of the geography of Switzerland. It is accompanied by a treatise on the hypsometry of the country and orography of the Alps, in which the author gives a comparison of the mean depressions of valleys and mean altitudes of mountain-ridges, and which should be consulted by all who are interested in the physical geography of this country so fertile in subjects of scientific interest.*

Spain.—I cannot avoid allusion to a work published last year, under the authority of the Spanish Government, by Don Pedro Antonio de Mesa, giving a physical and hydrographical account of the basin of the Ebro. The author says that it is based on the same principles as the *Memoir* on the Guadalquivir already published, and he commences his work by a geographical description of the position and extent of the basin, being the most northern region of the peninsula, and having a maximum breadth of 270 kilomètres, and a maximum length from Peña Labra to the island of Buda of 520 kilomètres. It contains twelve out of the forty-seven provinces of Spain, with a superficies of 83,530 square kilomètres. It is divided into three portions, upper, middle, and lower, and contains four great secondary basins, corresponding with its four principal affluents, viz. the Jalon, the Aragon, the Gallégo, and the Ségre, the three latter of which descend from the Pyrenees.

* I am indebted also to Professor Paul Chaix of Geneva, another of our Honorary Corresponding Members, for some further details regarding the advances made towards a more accurate knowledge of the physical geography of Switzerland and the neighbouring countries, some of which are of geological rather than of geographical interest. He informs me that M. Dausse, in a contribution to the Helvetic Society of Naturalists, on the past and present state of the lakes of Lombardy, admits that some of these lakes were formerly united in one large basin, including the present lakes of Varese, Lugano, Orto, and Lago Maggiore, discharging its water through the south end of the lake of Orta, and the valley of the river Agegna.

In this elaborate work the author describes, further, all the affluents of secondary and even third-rate importance, gives a detailed account, accompanied by many cross sections, of the different regions through which the river flows, and the various ways in which the water is utilised, concluding by describing the great canal and irrigation works now projected, or in course of construction, in the lower course of the Ebro. Other minor works and canals are carefully detailed, and the author endeavours to show the capacity of the different rivers, together with the best means of applying the water supply to the various wants of the province, and the proportion in which it should be done.

ASIA.—*Researches of Russian Geographers*.—Through the kindness of M. F. Osten Sacken, the Secretary of the Imperial Geographical Society, I learn that Prince Krapotkine made a journey in a mercantile caravan from Tsuruhailovietsk,* on the river Argun (s.e. of Nerchinsk), to the city of Merghen, in the province Heluntsiang of Chinese Tartary, and thence to Blagovestchensk on the Amur. This country was previously known only from hearsay and old Jesuit maps, and the author brings to our knowledge the new and interesting fact that in these interior lands, and 900 versts from the sea of Japan, there is a true volcanic tract, called Niun Kholdengi, in which a volcano was in activity in the last century, and minutely described by M. Wassilief, a celebrated Chinese scholar. Prince Krapotkine has gone far to settle the question by a survey of the country immediately surrounding the point of eruption, as he has there found basalts, lavas, &c. He was not, however, able to visit the old focus of eruption.

On the southern coast of Mandchuria, a region of which we have till lately been very ignorant, it appears from the researches of MM. Bendestchaff, Timroth, and Helmersen, that a profitable fishery in crabs, sand-eels, and sea-weed is carried on in the bay of Passiet; the sea-weed forming an article of food sent to Gherin and thence to China proper.

In Eastern Siberia the result of the examination of the river Vitim is looked to with great interest. In Central Asia and along the new line of the Russian boundary M. Struve has determined ten new astronomical points, among which are Tchemkend, Taschkend, Tchinzaz, and the fort of Turkestan. Some of the corrections are considerable; for Taschkend is moved 37' of latitude and 30' of longitude to the s.e. from the position assigned to it in the last

* Zuruchaitui in English atlases.

map of Central Asia, published by the Russian Topographical Depôt.

By recent intelligence from Russia, I learn that a Siberian expedition was in progress on the 21st March last, under the management of M. Lopatine, to explore and report upon the physical geography and productions of the region near the mouth of the Yenissei, where that large stream falls into the glacial ocean. Former travellers had not, it appeared, advanced beyond 72° N. lat., or to the isles of Broikow; but it has been said that large quantities of cod and other fish exist still further north. At those islands, the river, having a width of 60 versts, its rocky banks covered with soil, takes a north-westerly direction, whilst the hills, which it quits, range to the north-east. In its course northwards from Turukansk, the Yenissei passes through those great and sterile flats so common in Northern Siberia, and known as the *Tundras* of the natives; and finally, when it enters the glacial sea, black rocks (supposed to be carboniferous) form its flanks. During the progress of this expedition the important discovery has been made of entire skeletons of mammoths, whose skin and hair have been preserved in frozen mud, like those of the specimen found many years ago near the mouth of the Lena, and long exhibited in the Museum at St. Petersburg. It is further stated that the heads of these extinct elephants were, for the most part, turned towards the south, as if the animals had been retreating southwards when caught either by an inundation proceeding from the North Polar region, or by a change of climate due to a wide elevation of land, their former pasture grounds being converted into the frozen soil in which the mammoths have been preserved to this day. If this account be substantiated, it offers new data for the reasoning of Geologists, who have hitherto had great difficulty in accounting for the prodigious quantities of mammoth tusks or ivory found in the Liakow Isles (New Siberia) in N. lat. 75°, as well as in Eschscholtz Bay, in Behring's Straits, without inferring that these remains had been transported from lands on the south and from the flanks of the Altai and Ural Mountains. But the preservation of so many entire animals of this size in such high northern latitudes induces me to modify somewhat the views I formerly entertained,* and to suggest that all northern Siberia, which is now so glacial, was, during the age in which the mammoth lived, a continent covered with a vegetation adequate to support vast herds of these huge animals, even up to 75° N. lat.

* See 'Russia in Europe, and the Ural Mountains,' vol. i. p. 492, *et seq.*

This view is, indeed, sustained by the researches which have been made from north to south; for, when we travel southwards, we find the mammoth remains becoming much scarcer, and, instead of whole animals, we meet with their broken and disjointed bones only, as if they had been transported from the north. Having satisfied myself by wide personal examination that other drifted materials, which proceeded from north to south, cover large regions of European Russia, Prussia, and Northern Germany (in many places superposed by those great erratic blocks which were conveyed in former icebergs), and seeing in our own islands similar evidences, I now infer that the chief masses of such *marine* drift were deposited whilst a prodigious change of climate was being effected over the northern hemisphere, large portions of which, like Northern Siberia, antecedent to such perturbations, were *low lands* indented by *marine estuaries*—whilst other countries, as Russia in Europe and Northern Germany, were then entirely under the sea. The simple fact alone of the absence of all northern drift, or of any erratic blocks over all Siberia, is, indeed, in direct contrast to the state of the surface of European Russia, Northern Germany, and the British Islands, and shows us, that when the great, and possibly sudden, change of climate occurred, by which the mammoths were destroyed and entombed *in situ*, Northern Siberia was largely inhabited by those animals.*

As respects Central Asia, I may state that, at a late monthly meeting of the Imperial Geographical Society of St. Petersburg, a remarkable memoir was read by Colonel Heinz, relating to the Mahometan people of Western China, called Dungans (Doungans in French), who are in actual revolt against the governing or Mandchu Imperial dynasty.

With the exception of the inhabitants of Chinese Turkestan, these Dungans, constituting, according to this author, a population of thirty millions, occupy in great numbers the provinces of Kan-si, Chem-si, Szechuan, and Yunnan and tracts north of the Thian Chan Mountains. From a residence, during the year 1865, among the Kirghis on the Russian frontier, Colonel Heinz obtained much curious information respecting these people and the origin of their quarrel with the Mandchu Tartars in the town of Si-ngang-fu. He is of opinion that the insurrection is too wide-spread and deeply rooted to be put down by the present feeble Government of China.

* See Lyell, 'Principles of Geology,' with citations from Pallas, Wrangell, Baer, and Middendorff, pp. 79 to 86.

In the discussion which followed the reading of this paper, differences of opinion were expressed as to the real number of Mahometans inhabiting China,—no one, however, placing it below twenty millions; whilst, on the whole, it seemed apparent that a religious element was at the bottom of an insurrection which has spread from the interior province of Chem-si or Shem-si towards the Russian frontier.

Considering the apathy of the Chinese Buddhist, and how a spurious and debased imitation of Christianity was rapidly propagated by the fanatical Taipings in other provinces, who can say that, if powerful leaders should arise, Islamism may not soon overspread a wide area of the Chinese Empire!

Region of Central Asia, between the Russian Frontiers and British India.

—At our last anniversary, when I treated of the new frontier of Russia along the Khanat of Khokand, I directed your notice to the extensive and lofty region which lay between that line and Cashmir, the north-western advanced post of British India. Recently our attention has been called to a large portion of this almost unknown territory, in the great intermediate ocean of sterile mountains bearing the general name of "Pamir," an account of which was given to the Imperial Geographical Society of Russia by M. Veniukof, founded on a manuscript narrative of travels which was lodged in the Topographical archives of St. Petersburg in the year 1806.

After M. Veniukof's memoirs were translated, for our Society, from Russian into English, the quotations in them from the MS. narrative were found to contain so many anomalous and inexplicable statements, as well as mistakes of names, &c., that two of our best Oriental scholars, Lord Strangford and Sir H. Rawlinson, were induced to think that the Russian Government of that period had been imposed upon, and had purchased a made-up document not founded on true observations. Sir H. Rawlinson, indeed, gave us an elaborate criticism upon this narrative, purported to be written by Herr Ludwig von ———, an unknown German, who it was said, when employed by the India Company, went into the table-land of Pamir to purchase horses for the cavalry, accompanied by sepoy and a Lieutenant Harvey. Since this sterile country, as far as is known, contains small horses or mere ponies only, wholly unfitted for the use of cavalry, and as no record could be found of any such officer as Lieutenant Harvey, it was very natural that Sir H. Rawlinson, who had taken great pains to inquire into the facts, in the

desire to ascertain the truth, should have been led to throw serious doubts upon the narrative. On writing to my friend M. Khanikof, the accomplished Russian geographer, who has explored and described large portions of Persia and Central Asia, and who, two years and a half ago, wrote to me about this very Pamir land, I received from him an explanation, of which the following is the substance* :— M. Khanikof admits that certain inaccuracies in the narrative of the nameless German may have justified the doubts of Sir H. Rawlinson; but adds that in order to form a correct judgment our geographers must wait until they examine the original documents. For, besides the narrative, there are maps which, considering the period of their execution, are so very good as to have convinced the Russian geographers that they were laid down upon the spot, and after good astronomical observations. Now, those topographical works have never been seen out of the archives of St. Petersburg, and they constitute by far the most important part of the subject. The imperfect narrative must have been composed (M. Khanikof thinks) long after the survey was made, and by the person who brought the maps for sale to the Russian capital in the year 1806; it being further believed that the survey was made during the last twenty years of the last century, several substantial reasons for which are assigned. In showing that there is a mixture of truth with a good deal of inaccuracy (indeed Sir H. Rawlinson also had stated as much), M. Khanikof relies mainly on the authenticity of the map, and seeing its close approximation to accuracy in those contemporaneous tracts where observations have already been made, particularly along the course of the Syr Daria or Jaxartes, he is of opinion that the survey must have been faithfully made in the very region it illustrates.

Whether or not this explanation of M. Khanikof will prove satisfactory to our learned critics, I cannot but hope that we shall ere long obtain copies of the maps, which are, after all, the materials to interest us much more than the defective narrative.

Among the numerous desiderata which remain to be worked out by geographers—a long array of which I mentioned in the Address of last year—the great table-land of Pamir, as well as vast adjacent

* This letter will be published in our Proceedings. Whilst this sheet is passing through the press, I have received a second and much longer letter from M. Khanikof, who, having in the interval visited St. Petersburg, and carefully studied the narrative and maps of the unknown German, has discussed in detail nearly all the objections made by Sir H. Rawlinson, and has so far vindicated the general accuracy of the mysterious traveller. This letter will also be published in our Proceedings.—June 26th, 1866.

tracts of wild countries, still remain to be surveyed by topographers. For although Lieutenant Wood visited the source of the Oxus, and several others of our countrymen have explored adjacent tracts, still the old map in the possession of the Russians, as described by MM. Khanikof and Veniukof, must be viewed as a curious document. In the mean time I have only to hope that in the sequel British and Russian explorers may meet in this hitherto unknown territory to determine its exact physical features. Even granting that the map of the nameless German is found to be truthful in its broad outlines, the instruments used by geographers in the last century were comparatively defective. The valleys and uplands of Badakhshan and Pamir, lying to the north of the lofty Hindoo Kush, will therefore I trust, remain for ages to come the neutral ground between British India and Russia, in which the geographers of both countries may meet to promote the science which they cultivate, and much of the advancement of which in Central Asia is already due to the labours of our Northern allies.

Of another part of this wild region, concerning which we have heard little since a portion of it was described by the brothers Schlagintweit, we had an interesting account at our last meeting in the paper communicated by our medallist Captain Montgomerie. This is the country extending northwards from the Karakorum Pass to the city of Yarkand, in Chinese Turkestan, and through which flows the river Karagash as it descends from the Western Himalayas. This tract was explored and surveyed in 1863-4 by a native Moonshee, engaged by the Indian Government, furnished with proper instruments, and duly instructed by Captain Montgomerie, who was then directing the Great Trigonometrical Survey in Cashmir, Ladak, and the surrounding countries. Residing for some months at Yarkand, this envoy made many astronomical observations which determined the position of the city to be $38^{\circ} 20'$ N. lat. and $77^{\circ} 30'$ E. long.; thus showing certain differences between his results and the estimates of the French Jesuits on the one hand, and of the Schlagintweits on the other. The altitude of Yarkand was ascertained to be about 4000 feet above the sea-level, and the climate in winter to be so severe, that the thermometer, early in January, sank nearly to zero. We also learn from this native traveller (who unfortunately died on his return just after he crossed the mountains into country under British protection) that the precious stone called jade (the Nephrite of mineralogists) occurs in some quantity on the banks of the Karagash.

Now, as this mineral is also found in that part of Eastern Siberia watered by a great affluent of the Amur, whence the large block of it in the British Museum was brought by M. Alibert, we know that this stone, so prized in China, occurs at intervals through a wide space of Central Asia.

On this occasion Captain Montgomerie gave us a vivid picture of the grandeur of these mountain ranges, so large a portion of which has now been accurately laid down by the Great Trigonometrical Survey. The journey of the Moonshee has enabled him to ascertain that from Jummo, or any point in the Punjab at the foot of the Himalayas, it takes a man, assisted by a pony, sixty-six days to cross the mountains, and during that period the road lies for twenty-five days over country never lower than 15,000 feet, and for forty-five days never below 9000 feet above the sea-level. The elevated ranges may therefore be said to be at least 400 miles across at their smallest breadth. During the years which the Survey has been directed in these regions by Capt. Montgomerie, he has informed us that the whole of the Karakorum and Mustakh range has been defined, forming the boundary between Little Thibet and Turkestan; and that the altitude of the peaks for 450 miles varies from 21,000 to 28,300 feet, a very much higher range than that of the Himalayas to the south of Ladak and Little Thibet.

The description given by Capt. Montgomerie of the appalling difficulties overcome by the surveyors under his direction, when they explored this lofty chain, made a profound impression on all who heard him, and we have only to hope that our Medallist and his gifted associate Capt. Godwin-Austen will ere long make known to us the true physical geography of the vast region which lies between the sources of the Indus and those of the Brahmaputra.

Before we quit the consideration of these lofty mountains in Asia, I must particularly advert to the last number published of the splendidly illustrated fasciculi in folio, prepared by the brothers Hermann and Robert von Schlagintweit. Besides the meteorological data communicated both in the letter-press and in instructive tables and diagrams, the sketches, printed in oil-colours, are most striking and effective; particularly those which represent the great snowy chain of the Kuen Lun in the distance, from Sumgal in Turkestan, and the Salt Lakes of Tsomoriri and Tsomognalari in Western Thibet.

*Great Trigonometrical and Topographical Survey of India.**—The great

* Abridged from a memorandum by Colonel Thuillier.

triangulation of Hindostan has extended now over at least three-fourths of the entire area of that country, fixing the true positions of all the chief cities, towns, and places of importance. One of the blanks to be filled up is in Eastern Bengal and Assam, comprising the whole of the lower provinces east of the meridian of Calcutta. The extension of the great longitudinal series of triangles from Kurrachee in Sindh to Calcutta, is now being carried eastwards along the parallel of 23° N. lat. to the extremity of the British frontier, to tie another meridional series progressing southwards from the Cossyah mountains, in about 92° E. long., down the frontier towards Arracan and Rangoon; and the point of junction has been effected just below the British station of Tipperah or Comillah. This quadrilateral, which embraces all Bengal Proper east of the meridian of Calcutta (with the exception of a portion of the Brahmaputra River and Upper Assam, which will be separately provided for), will require an intermediate series of principal triangles to fix the city of Dacca and other places of importance in Eastern Bengal on the meridian of 90° E. long.

The northern longitudinal series, from the Sonakhoda or Darjeeling Plains base, up the valley of the Brahmaputra River, is completed as far as Gowhatty in Assam, and it will hereafter be continued in a north-easterly direction to the extreme limits of the British frontier on the borders of Thibet and Burmah.

The remaining work to be done by the trigonometrical operations lies in Central and Southern India, and on the Coromandel coast, below the parallel of 23° N. lat. A principal series has long been in progress along the coast from Calcutta towards Madras, which place it has nearly reached. Another base of verification has lately been measured at Vizagapatam.

Between the coast and the great arc series, on 78° E. long., a large tract of difficult and but little known country has to be taken up. This large ellipsoidal figure, comprising Berar, Gondwana, the Jungle-Mehals, Sirgoojah, Sumbhulpoor, the Khond country, Goomsur, &c., perhaps some of the most unhealthy parts of India, is now being provided for by meridional series of principal triangulation, extending southwards from the great longitudinal section, on the meridians of 80° , 82° , and 84° E. long. These will be tied by another cross longitudinal section from the Vizagapatam base to the Beder base, on the parallel of 18° N. lat., and so across the peninsula to Bombay, in the vicinity of which another base will have to be measured, and which will complete two more grand quadrilaterals

(verified by six bases*) of about equal areas to the northern ones.

The whole of the southern peninsula below the parallel of 18° has been covered by a network of triangulation, performed many years ago, with less pretension to the scientific accuracy of the later operations, and with inferior instruments. To perfect the great work according to the system of modern refinement pursued for some years past, the Coromandel coast principal series will have to be prolonged from Madras to Cape Comorin and Ceylon, with a cross section from Madras to Bangalore and Mangalore, in 13° N. lat., and a fresh series on the meridian of Mangalore, in 75° E. long. This will divide the southern peninsula into four remaining smaller quadrilaterals, which will be checked by additional base-lines, to be laid down at Bangalore, at Cape Comorin, and at Mangalore on the western coast. An independent base will likewise have to be measured at Rangoon, to check the very long meridional series which will connect Pegu and the Tenasserim provinces on the eastern coast with eastern Bengal. A chart of all the existing and proposed triangulation has been deposited in the library of the Society.

On the rigorous basis of triangulation adopted, which is carried out with the largest instruments and all the refinement due to geodesical operations of the first order, the topography of an enormous area has already been laid down. Those portions of India which are exclusively British possessions, and fall within the regular assessment of the land revenue, are delineated on the 4-inch scale. This is reduced and published on the 1-inch scale, and further reduced for incorporation into the General Atlas of India, published in England on copper on the $\frac{1}{4}$ -inch scale. The native independent, or tributary states or possessions, are surveyed on the 1-inch scale only, the standard scale for all general maps, and which is sufficient for military or government purposes, and where no revenue is derived from the land.

Assam, Upper and Lower, now growing into great commercial importance, remains to be taken up, and will be immediately entered upon, with the view to a regular settlement of the country, and the definition of the numerous tea plantations and grants of waste lands

* Calcutta	}	Coast.
Vizagapatam		
Beder	}	78°
Sironj		
Bombay	}	Coast.
Kurrachee		

made under the fee simple rules. The territory recently ceded by Bhootan, and now known by the name of the Bengal Dooars, is now occupied by the surveyors, who are defining the northern line of frontier. A preliminary sketch map of this tract of country, which is most unhealthy and difficult of access, has been brought out for the guidance of the troops employed, but owing to the great jealousy of the Bhooteas, our previous knowledge of it was exceedingly meagre.

When we consider the enormous extent of British India, and its proportion to the area of the British Islands, the relative periods occupied on the two great national surveys, it cannot be wondered at that there is still a great deal to be done in the former country, where the first commencement was made during the earliest part of the present century. Fresh conquests of late years have added areas larger than our own islands, all requiring to be provided for, before even the older provinces could be got through. As an instance, it may be mentioned that the Nagpore and Nerbudda districts in Central India, recently formed into a separate agency or chief commissionership, under the designation of the Central Provinces, aggregate an area of very nearly 115,000 square miles, about equal to the whole of the British Islands.

The same staff that served with Captain Montgomerie, in the arduous survey already alluded to of the mountainous northern frontier, are now employed in extending the topographical survey of the Himalayas in British Ghurwal and Kumaon, eastwards as far as the Nipal frontier, where it is feared these most interesting operations must come to a stoppage, unless the inherent jealousy of the Nipalese can be overcome in the interests of science, which is more than doubtful.

The northern portion of the Punjab (comprising Hazara, Jhelum, and Rawul Pindi, districts subtending the Indus River, which are all of a very intricate and hilly character) has been laid down in a very masterly manner, and the 1-inch lithographed sheets are perhaps as fine specimens of the delineation of difficult ground and topographical drawing as can be met with in any country.

The Native States of Rajpootana in Central India, the Tributary Gurjat States of Orissa with Bustar, Chinna-Kimedy, &c., the South-west Frontier Agency in Chota-Nagpore, the Godavery Talooks and assigned Districts of East and West Berar, ceded by the Nizam of Hyderabad, together with Pegu, are all now in good progress, and being prosecuted as rapidly as local circumstances will allow; but

an enormous area in these several localities still remains to try the endurance and ingenuity of the surveyors.

The Nizam's dominions of Hyderabad have just been completed, and the whole of the Madras or Southern Peninsula was depicted many years ago by the Madras Military Institution surveyors on the 1-inch scale. On this survey those sheets of the Indian Atlas were published. With the lapse of time, change of appearance of the country, the introduction of roads, railways, &c., and the enhanced value of the land, a second survey became a necessity, and this now in progress, will, it is hoped, be the means of enabling the Geographer for India to supersede all the old sheets, which may be more or less obsolete, with new ones.

Of the Bombay Presidency there is a great want of good topographical maps, especially of the northern portion, about Baroda, Surat, Ahmedabad, Goozrat, and Cutch. The regular survey in this Presidency was unfortunately stopped several years ago, and until very lately it has never been carried on again. For the sake of the Atlas of India it is to be hoped that nothing may again interrupt the regular course of the operations.

The Indian Atlas comprises, according to the Index Map issued under the authority of the late Court of Directors of the East India Company, 177 proposed sheets or sections. Each sheet measures $40\frac{1}{2}$ by $27\frac{1}{2}$ inches, or nearly $2\frac{1}{4}$ degrees of longitude, and $1\frac{1}{4}$ degree of latitude, and embraces an area of 17,824 square miles, and is engraved in England on the $\frac{1}{4}$ -inch scale. Of these sheets, up to the present date, $78\frac{1}{2}$ sheets have been published.

Printed progress reports illustrative of the whole of the operations in India up to the present season, and Index Maps, showing the state of the Atlas, have been deposited in the Society's library by the Surveyor-General of India, together with copies of such miscellaneous and general maps, lithographed in Calcutta, in anticipation of the publication of the engraved sheets of the Atlas as were deemed likely to be useful and interesting.

Chinchona Cultivation in British India.—In a previous Address I dwelt upon the valuable service rendered to the natives, colonists, and soldiers of our great Indian possessions by the labours of our accomplished Secretary and enterprising traveller, Mr. Clements Markham, who was the first to introduce the cultivation of the best species of Chinchona-plants, collected in the Andes of Peru and Ecuador, into India. As the Secretary of State for India deemed it to be essential to ascertain the progress made in the

growth of these plants in their new habitats, he sent Mr. Markham last winter to make the inquiry, and in consequence the public are now furnished with a clear and most satisfactory Report, which I consider to be one of great national importance.

Chinchona cultivation was introduced into India in 1861, by Mr. Markham,* and already, in February of this year, there were 984,143 plants flourishing in the Government plantations on the Neilgherry hills alone; while the cultivation had been undertaken by numerous planters and private companies. The tallest trees were found to have reached the height of 17 feet, and an unlimited supply of seeds will have been obtained from them this year. The Government plantations on the Neilgherries, when completed, will cover 2200 acres. There are other Chinchona plantations in Ceylon, at Darjeeling, at Kangra in the Punjab, and at Mahabaleshwur, near Bombay.

Two of the measures necessary for the success of this great undertaking have been crowned with complete success, namely, the introduction of the most valuable species of Chinchonæ from the South American forests into India, and their conversion from wild into cultivated plants. The latter measure has been so successful that, whereas the largest yield of febrifuge alkaloids in Peruvian bark imported from South America is from 3 to 5 per cent., the bark grown in India, though only three years old, has already given the unprecedented result of 11 per cent.! This remarkable success in the cultivation is mainly due, as Mr. Markham tells us, to the great skill and ability of Mr. McIlvor, Superintendent of the plantations, who was elected a Fellow of the Royal Geographical Society during the present session.†

The points which remained for decision, connected with the Chinchona enterprise, were the best means of utilising the bark with a view to the spread of its beneficial effects amongst the millions who suffer from fever in India, and who cannot afford to buy quinine at 20s. per oz.; and the extension of the cultivation to as many different districts as possible.

Mr. Markham was called upon specially to report upon these

* The Secretary for India who employed Mr. Markham to collect the plants in Peru and transport them to India, was Lord Stanley; and it was his successor, Sir Charles Wood, now Viscount Halifax, who sent him to examine and report upon the progress made since the transplantation took place.

† I may add that Dr. Cleghorn, Conservator of the Madras Forests, and who accompanied Mr. Markham in Southern India, has also become a Fellow of this Society. Dr. Cleghorn is, I am told, one of the few men who have penetrated into the Anamallay mountains, and explored their almost unknown plateaux and forest-covered slopes.

points. Now, with regard to the first of them, he has tried several experiments with the bark on the Neilgherries, and has strongly urged the establishment of manufactories for the production of the febrifuge in so cheap, and at the same time so efficacious, a form, as to place it within the reach of the poorest ryot in India and his family. He has also recommended the employment of an eminent Dutch chemist, Dr. de Vry, as chemical reporter on the Peruvian barks grown in India. As to the second point, he explored the little-known hills of Travancore, examined the capabilities of the Pulney hills, of the wild and beautiful Koondah range, and of the coffee district of Wynaad. He went over the Travancore hills, through dense forests and over plains covered with elephant-grass 10 feet high, on foot; crossing the great river Perryaur on a rude bamboo-raft. The result of these journeys has been that he has succeeded in promoting the cultivation of Chinchona-plants in the Travancore State, on the Pulney hills, and by numerous planters in Wynaad.

Mr. Markham's great object is to see Chinchona-trees growing near each hut, in every village in the hill districts; so that the cure for the terrible scourge which now decimates the people may be at their doors, and that a decoction of Peruvian bark, at least, may be immediately procurable when the feverish season comes on. Although, in his highly satisfactory Report, Mr. Markham has not touched on the commercial aspect of the question, he thinks that Chinchona-bark will ere long form an important item in the list of Indian exports, and be another source of wealth to our Eastern Empire. In the mean time, I entirely agree with my sagacious friend Mr. John Crawford, whose authority on Indian affairs stands so high, that the thanks of the country are due to Mr. Markham for the great and beneficent achievement of the naturalization of Peruvian bark in India.*

Japan.—Although the coasts of the Japanese archipelago have been in part well laid down both by native Japanese cartographers and our own naval surveyors, our knowledge is still very scanty regarding the varied interior of these islands; it was therefore with great satisfaction that I listened to a paper by Commander Forbes, at our last meeting, describing two excursions which he had recently made into the interior of Yesso. Besides a sketch of the volcanic district on the shores of this island, and especially along the western side of

* See the 'Examiner,' May 12th, 1866. Sir W. Denison, the able ex-Governor of Madras, has also expressed this opinion. See 'Proceedings,' 11th June.

Volcano Bay, he gave us an interesting account of the Ainos, or race of hairy people, who still occupy the whole of the interior, and whose appearance and habits he had opportunities of observing. In the discussion which followed the reading of this paper, Professor Huxley gave us a most clear and striking account of the peculiarities of a skull of this curious people which Commander Forbes had brought home, and showed that, in its elongated shape, it differed essentially from the round forms of the Mongolian and other nations of Eastern Continental Asia, and showed affinities with the Esquimaux type. It is a singular circumstance that the Japanese offer the same peculiarity in form of skull, and Professor Huxley attributed this to their having commingled with the Ainos during past centuries.

AUSTRALIA.—In the general sketch of the progress of discovery and colonisation in the great British Terra Australis which I presented to you last year, little was said of the existing state of Queensland, for in truth such important advances were then being made, under the enlightened government of Sir G. Bowen, that I deferred enlarging upon the subject until the whole of the materials were before me.

Measured from its southern boundary, near Brisbane, the capital, to Cape York, the extreme northern point of the continent, the colony of Queensland has a length of 1100 geographical miles, and an average width of not less than 500 miles.

The region around Brisbane, formerly the Moreton Bay Settlement of New South Wales, had long been known as a healthful and thriving tract, but, in the absence of experience, few persons had anticipated that the greater part of the lands lying to the north of it, and ranging into inter-tropical latitudes, would be found suitable for Europeans, and still less that such lands would prove to be highly profitable grazing-grounds, where sheep as well as cattle could thrive and multiply, even up to 18° south of the equator. We have no longer to speculate upon hypotheses, and I have only to use the emphatic language of Sir George Bowen, when he last addressed the House of Assembly of that colony, to bring to your mind's eye what the rapid and at the same time solid progress of this colony has been :—

“Since the establishment of Queensland, in December, 1859,” says the Governor, “our European population has increased from less than 25,000 to nearly 90,000 ;—that is, it has been augmented nearly fourfold ; while our revenue, and our trade (including

imports and exports) have been more than trebled. The other chief elements of material prosperity have advanced in almost equal proportion. During the same short period, cotton, sugar, and tobacco have been added to our list of staple products; a line of new ports has been opened along our eastern seaboard from Keppel Bay to Cape York—a distance of a thousand miles; while pastoral occupation has spread over an additional area, at least four times larger than the area of the United Kingdom. In 1859, our settlers had hardly advanced beyond the Darling Downs to the west, or beyond Rockhampton to the north. Now, in 1865, there are stations seven hundred miles to the west of Brisbane, and eight hundred miles to the north of Rockhampton. These facts, derived from the official statistics, cannot fail to be interesting and instructive to our fellow-countrymen at home: while they must be to you, as they are to me, a subject of honest pride, and of devout thankfulness."

The progress of discovery in the unexplored tracts of this prosperous colony has been so rapid of late years, that it is difficult to keep pace with the strides which have been made. Amongst the most important of the expeditions which have led to the increase of our knowledge of the country, I may particularly mention that of the Messrs. Jardine, who in endeavouring to open up a route for the transport of cattle from the pastoral districts of Southern Queensland to the new settlement at Cape York, traversed the whole of the previously unknown western portion of the great North-Eastern Peninsula of Australia. The journey of Mr. J. G. Macdonald must also be recorded as one of the remarkable events in the progress of discovery in this part of the continent; this traveller having, in the latter part of 1864, crossed from Port Denison to the Albert and Nicholson Rivers, and returned by nearly the same route, after exploring a large extent of new country. The narratives of both these expeditions will be published in the next volume of our Journal; and I may also refer you to the volume recently published for an account of another successful exploration which seems likely to lead to results of great practical importance: I mean the discovery by Mr. J. E. Dalrymple of a route between Rockingham Bay, over the precipitous coast range, and the pastoral country of the Valley of Lagoons, by which the produce of the extensive table-lands of the interior will find an easy outlet to the seaboard. The journal of Mr. Dalrymple, already known for his previous geographical exploits in Northern Queens-

land, in company with Mr. A. J. Scott,* gives a vivid picture of the physical features of the Rockingham Bay District.

In sending home an able memorandum, prepared at his request by Mr. W. E. Lamb, respecting the last settled country at the head of the Gulf of Carpentaria, Sir George Bowen adverts to its details as proving the unprecedented rapidity with which pastoral occupation has advanced in northern Queensland during the last few years, thus giving a distinct contradiction to those persons who, judging from the condition of countries on similar parallels north of the equator, had inferred that sheep never could flourish or produce valuable wool in such inter-tropical latitudes. On former occasions I have endeavoured to check this incredulity by reference to what I considered to be good evidences of the capability of successful sheep-farming as derived from the experience of Landsborough and M'Kinlay, and, indeed, from all the bold explorers who understand the subject. We are now told by the Governor, that sheep-farming has spread, within the last four years, over an additional area equal to that of France, and that sheep are now successfully depastured as far north as 18° s. lat., both at the head of the Gulf of Carpentaria, and also towards the eastern seaboard of the colony, upon the elevated plateau above Cardwell, the new township in Rockingham Bay, named after the vigilant Minister of the Colonies. And here it must be recollected that a large portion of this northern territory of Queensland consists of basaltic table-lands, having an altitude of from 1000 to 3000 feet above the sea, and therefore enjoying, during several months of the year, a comparatively cool climate. Indeed, Sir George Bowen estimates that at this time (January 1866) there are feeding in the extreme northern pastoral district of Burke alone (full accounts of which have recently been given in our 'Proceedings') at least 110,000 sheep and 12,000 head of horned cattle. At the new Port of Burketown, on the River Albert, there were some 300 inhabitants when he wrote (Jan. 18th), destined, doubtless, to be the founders of a great mart of commerce, and an entrepôt between our Indian and the mass of our Australian settlements, through the grand indentation of the Gulf of Carpentaria, which penetrates 500 miles into the continent. Again, at the eastern point of this grand bay, the new settlement of Somerset, near Cape York, in 11° s. lat., so well described in our 'Proceedings' by Mr. John Jardine, has been a complete success; and the Europeans who have now been there for

* See 'Proceedings,' vol. viii. p. 110.

nearly two years, find the climate so agreeable and healthy that Mr. Jardine is of opinion that it may become a sanatorium for invalids from our establishments in India and China. The new port is already much resorted to by ships passing through Torres Straits, and hence there is every prospect that Cape York may one day be to Australia what Singapore is to our Indian Empire and the great Eastern Archipelago.

But to return to the consideration of the great region lying immediately to the south of the Gulf of Carpentaria. We now have in the report of the Crown Commissioner, and on the authority of Sir G. Bowen, the most reliable evidence that this country is eminently adapted for stock of all sorts. Besides the richest grasses, there are many plants on which sheep and oxen thrive, such as "salt-bush" and "native leeks, carrots, and cucumbers;" whilst it is believed that in no part of the region to the north of the 19th or 20th degree of latitude do those droughts prevail, which have proved so prejudicial in other and more southern portions of the mainland of Australia. With nights invariably cool, and with much moisture retained in wooded and richly-grassed extensive plateau lands, the heat is necessarily modified; the average temperature in lat. 20° being 74° Fahr. There can indeed be no difficulty, as I have said in former addresses, in explaining why the isothermal lines of Northern Australia should differ much from those which pass from east to west in similar latitudes to the north of the Equator, where no such terrestrial conditions exist, and where rocky and sandy soils, in great part, at no great elevation above the sea form a peninsula in the midst of a hot Indian ocean. This evidence exists indeed in Australia itself, for the new settlement of Somerset at Cape York, in 11° s. lat., jutting out into a warm sea, is just as unsuitable for sheep as the same parallel n. of the Equator in southern India.

To satisfy you as to the wonderful progress of these newly inhabited parts of Queensland, I may refer you to the February number of our 'Proceedings,' in which we learn from Mr. Landsborough that Bowen, the town of Port Denison which arose in 1861, had reached in four years a population of 1000 persons, and that Rockhampton, on the Fitzroy River, had risen in eight years to a population of 5000 to 6000 inhabitants.

When, however, we turn from Queensland, that highly flourishing north-eastern colony of Australia, and look to the results of the efforts which have been made to found settlements on the northern

coast, I am compelled to acknowledge that there is little or nothing to encourage the hope that the extreme northern shores of that coast will ever be found to be suited for the colonisation of European settlers. Indeed, I never anticipated a successful result from the bold endeavours made by the South Australians to form a settlement at the ultimate point of the explorations of McDouall Stuart, which terminated in a seaboard of low altitude, and within 12° of the Equator. I was, therefore, quite prepared to learn that such an enterprise would prove a failure, which I fear it is, if I rightly judge from the lively and well-written description of Mr. Stow, who, with his companions, faced and surmounted all the dangers of an open-boat voyage of 1600 miles along the whole of the northern coast, to escape from that port and reach the settled colonies on the West, rather than remain in so ill-selected a spot.*

From that narrative we also learn that, considering the numberless reefs and islets which stud that northern shore, and the vast low swamps and jungles extending over a considerable portion of the mainland, no one can anticipate the successful formation of British settlements. Even when the explorers in their bold boat-voyage reached Camden Bay, already a settlement, and with a certain amount of elevated and high land behind it, they found much distress among the settlers, and sheep perishing from the heat of the climate.

Although these discouraging accounts have been received from the new settlement in the northern territory, it must be recorded, in justice to the Government of South Australia, that they have now taken all the necessary steps to ensure a complete survey of the country around Adam Bay, and learn its capabilities. In September last, as I am informed by our associate Mr. F. S. Dutton, an expedition was despatched, under the command of the well-known explorer McKinlay, with forty horses and a suitable complement of thorough bushmen, and with instructions to explore the whole country south of Adam Bay, between the Victoria River and the Gulf of Carpentaria. Since then a map has been received of the Adam Bay district, in which, on a scale of 1 inch to 2 miles, the nature of the country is laid down, as surveyed by Messrs. Auld and Litchfield, Government Surveyors.

I must here, however, remind my associates that the only locality which I have for many years advocated, as by far the best adapted for any settlement approaching to the northern shores, has been overlooked in all the last efforts to form such settlements. That which

* 'Proceedings,' Feb. 20, 1866.

the extensive Gulf of Carpentaria effects upon a large scale, by forming a southern indentation into the Australian Continent for 500 miles, is effected on a smaller scale by the more circumscribed Cambridge Gulf, especially towards the south-eastern extremity, or the Queen's Channel. There, in a sheltered position, with fine adjacent plateau lands, an abundant vegetation, and at the mouth of the northern River Victoria, Mr. A. Gregory planted a station in the year 1859, and thence he made his famous journey across to the present Queensland. Mr. Wilson, who was left in charge of the Camp, and who remained there for ten months, gave us a most satisfactory account of the climate and productions of the district. When we reflect that this locality is at least three degrees of latitude further removed from the Equator and the Indian Ocean than the new settlement of the South Australians at the mouth of the Adelaide River, and is backed by lofty and productive lands, we may reasonably anticipate that, with the extension of colonisation westward from the shores of the Gulf of Carpentaria, the time is not distant when the fine deep bays at the head of Cambridge Gulf will also, like the Gulf of Carpentaria, become the resorts of British commerce. Again, such land-locked waters, midway along the northern shore, and contrasting strongly with the exposed flats of Adam Bay Settlement, will serve as harbours of refuge for our mercantile marine, and be, as I urged when occupying this chair many years ago, of real service to the nation in case of a maritime war as a station for fleets destined to protect our Eastern commerce. I now, therefore, renew the gratification I experienced in the year 1857, when I heard the then Minister of Her Majesty's Colonies, now Lord Taunton, say, on receiving our Founder's medal for Mr. Gregory, that after the description of the soil and climate at the mouth of the Victoria, "it was no extravagant supposition that some of us may live to hear of that hitherto unknown region becoming the home of a prosperous British settlement." Such I am persuaded would already have been the issue, if the colonists of South Australia had chosen the Queen's Channel of the Cambridge Gulf as the seat of their bold enterprise, instead of the extreme northern and exposed situation of Adam Bay, to which McDouall Stuart had so boldly advanced.*

* Since this address was read, and whilst these pages are being prepared for the press, I learn that the distinguished Australian surveyor John McDouall Stuart died on the 5th of June, at Notting-hill. I have in former Addresses so highly eulogised the labours of this adventurous explorer, that I may refer my readers to them as a record of his successful career as a traveller, and as a tribute to his memory.

I cannot quit the subject of Australia without again alluding to the laudable and strenuous exertions which the inhabitants, and particularly the ladies of Victoria, led on by our gifted associate Dr. Mueller, have been and are making to discover the line of Leichhardt's route in the interior. If this effort has not the good fortune to save any one of his party who may have survived, it may at all events determine the fate of the great explorer. Animated by the example of the ladies of Australia, and seeing that the Colonial Legislatures of Victoria, South Australia and Queensland had subscribed 1500*l.* towards this expedition, which must assuredly have important geographical as well as pastoral results, I had much pleasure in proposing that our Council should grant 200*l.* towards this object. It was, indeed, most gratifying to me to know that the Queen headed this subscription with a donation of 100*l.*, whilst Mr. Cardwell, Her Majesty's Minister of the Colonies, handsomely united with us in augmenting the fund. The very announcement of this subscription will, I hope, convince the Australian colonists of the deep interest which is taken in their welfare by their Sovereign and the mother country. Unhappily, the unprecedented drought of the past season was fatal to most of the horses of the expedition under Mr. McIntyre;* but we may rest assured that Dr. Mueller and his associates will be reinvigorated in their spirited exertions, by the proofs of the interest taken in the successful issue of this stirring enterprise by their Sovereign and their friends in England.

SOUTH AMERICA.—The exploration of the River Purus, one of the most important branches of the Amazons, for nearly 1900 miles, and the determination, for the first time, of its true course throughout that long distance by a series of astronomical observations by Mr. Chandless, for which the Council has conferred upon him the Patron's Medal, was undertaken voluntarily, and at his own expense, with the object of determining a question not only of great geographical interest, but of the first importance to the inhabitants of the countries situated between the Eastern slopes of the Andes and the Amazons; namely, whether or not a direct communication exists which may be made available by this river, as has been long supposed, between those countries and the Atlantic.

All we knew till recently of the Purus was, that it is a river of the first magnitude, discharging itself into the Amazons by four

* By the last account the expedition had reached a well-watered country, and were proceeding steadily to the west.

mouths, one of which is described as more than half a mile in width, and 18 or 20 fathoms in depth at a mile from its mouth, and supposed to have its origin at no great distance from Cuzco in Peru, where the greatest want of the inhabitants is such a means of intercommunication with the rest of the world, and an outlet for their valuable products and mineral wealth without the enormous cost and difficulty of transporting them over the Andes for shipment; but neither under the Governments of the Sovereigns of Spain or Portugal, nor their successors, has any one been known to have descended the Purus from Peru, to verify its capabilities. Fear of the savage tribes who live upon its upper affluents has hitherto effectually barred their examination.

The general course of the river, as shown upon our maps, was originally laid down from information collected from the Indians in the time of the Spanish rule by the missionaries, whose well-known labours in those regions entitle them to all praise. The best delineation of it, upon their authority, is that given in the great map of South America by Don Juan de la Cruz, in which it appears as originating near the mountain ranges of Paucartambo, and at no great distance from Cuzco; and this was corroborated by later accounts, and especially by those obtained by Don Taddeo Haënke at the close of the last century, whilst exploring the Beni and other affluents of the great river Madeira, as may be seen in his interesting memoir upon those rivers in the fifth volume of our Journal.

We knew little more of the Purus till our indefatigable Secretary Mr. Markham, in the course of his travels in the department of Cuzco, undertook a journey from Paucartambo with the express object of determining, if possible, its true sources. Following the course of the Tono, he penetrated the dense forest through which it runs, and after a tedious and difficult passage reached a hill from which he obtained a view of a great river running eastward, which, from all the accounts given him, he felt satisfied could be no other than the Purus. He described it as a mighty stream, there called the Madre de Dios, or Amaru-mayu, and said to be increased, 100 miles beyond, by two great rivers, the Araza or Maracapata, and the Ynamberi. The point where he saw it he fixed in lat. $12^{\circ} 45'$, long. about $70^{\circ} 30'$ W. There was, no doubt, ample ground for such a belief, but it must be admitted there was no certainty regarding the information so collected. No one had ever been down those rivers, and the only point positively determined was the position of a mighty stream, where Mr. Markham saw it, running in the direction of the

reported course of the Purus, which it was supposed, from all accounts, would be found to be the main source of that river.

In the mean time, however, the same uncertainty no longer existed with regard to the lower parts of the Purus, which had become more or less known from its being resorted to at certain seasons by traders from the Amazons in quest of turtle, and the sarsaparilla, copaiva, and India-rubber found in the forests through which it flows. Their reports of the possibility of ascending it for several hundred miles induced the Brazilian Government to send exploring parties up it, in the hope of opening a communication between its higher waters and the Bolivian settlements above the falls of the Madeira; but those expeditions led to no other results than to confirm the previous report of there being no serious impediment to the ascent of the river for upwards of 1200 miles.

Mr. Spruce, who has passed so many years in the regions bordering on the Amazons, obtained the diary of the commander of one of these expeditions, one Serafim Salgado, which he translated as a note to Mr. Markham's 'Cieza de Leon,' a volume printed for the Hakluyt Society. It took that party four months in two canoes to reach the mouth of the River Aquiry, the principal affluent of the Purus from the south, near which they were met by a party of the Canamary Indians, whom Serafim describes as cannibals, preparing to kill and rob them. This imaginary danger escaped, they proceeded some days higher up the river, when Serafim says it was impossible to go on, the river having become so narrow and obstructed that it did not admit of the passage of even the smallest canoe.

Mr. Chandless (who could not have seen Serafim's paper) has shown both these statements to be singularly incorrect. He describes the Canamarys as the most honest and civil of all the Indian tribes he fell in with; and as to the navigation beyond being impossible, he went up the river 600 miles further, sufficiently proving how little such information is to be trusted.

Mr. Chandless's diary of his own Expedition, which was read at the meeting of the Society on the 26th of February, will appear in the next volume of our Journal. The result will disappoint the hopes entertained of this river being available as an outlet for the produce of the eastern provinces of Peru. It sets at rest also all question as to the Madre de Dios being the Purus, Mr. Chandless having traced the latter throughout its long and tortuous course, for nearly 1900 miles, to its origin in insignificant streams, *two degrees to the north of the Madre de Dios*, where seen by Mr. Markham.

The question for us geographers then arises, What becomes of the Madre de Dios? Mr. Chandless inclines to think it may be one of the sources of the *Beni* which falls into the Madeira; if so, may it not be the Tuchi, described by Haënke (in the paper I have previously alluded to) as the farthest west of the affluents of the Beni, and laid down on the map accompanying his paper as joining the Beni in nearly the same parallel in which the Madre de Dios was seen by Mr. Markham running eastward. Moreover, I find, upon reference to De la Cruz's map, that the *Amaru-mayu*, which Mr. Markham gives as one of the names of the Madre de Dios, really does appear as one of the names of the *Beni* in that map. (See also D'Anville, whom De la Cruz quotes as an authority.)

On the other hand, the *Ynamberi*, which Mr. Markham was told fell into the Madre de Dios below where he saw it, is shown on the same map to run in a north-easterly, instead of westerly direction, and to form one of the principal branches of the Ucayali. But to which of these river systems, that of the Beni or of the Ucayali, the Madre de Dios really belongs, must now, I fear, remain in doubt, till some adventurous pioneer is bold enough to launch a boat upon the Madre de Dios, and risk his life among the savage Chuncho Indians, to settle the question.

I am happy to say that we have recently learnt that Mr. Chandless has safely returned down the Purus from his second voyage up it—the object of which was to explore the Aquiry, its main branch from the southward, which he was unable to examine on his first trip,—and that he may be shortly expected in this country with the details, which will then complete our knowledge of the Purus.

If, with the valuable aid of Sir Woodbine Parish, I have been thus diffuse, it is because this question is one in which South Americans take as deep an interest as the search for the sources of the Nile creates amongst geographers in our own hemisphere.

United States of Columbia.—I mentioned in my Address last year that His Excellency General Mosquera, who has been since chosen, for the third time, President of the United States of Columbia, was engaged upon a work on those countries. It has since been completed, and under the title of 'Compendio de Geografia General de los Estados de Columbia,' may be well called a complete Handbook, on the very best authority, of the countries it describes, and is highly creditable to the Gran-General, who, notwithstanding his many important duties has found time to compile such a mass of

interesting information. It is accompanied by an atlas of maps, corrected from the surveys of Codazzi and others, under the General's special directions.

Topographical Survey of Buenos Ayres.—From Buenos Ayres we have received from our Corresponding Member, Don Saturnino Salas, President of the Topographical Department of the Argentine Republic, the remaining sheets of the great survey of the Province of Buenos Ayres, recently completed by the officers of that department, and to which I must call attention, as showing the remarkable extension of those agricultural and pastoral establishments which promise to make it the most flourishing and important of all the South American republics; whilst steam and railroads, chiefly promoted by British enterprise, are doing their work in developing the resources of the interior, which, till a few years ago, was an inaccessible and uncultivated waste. The numerous names of our countrymen which appear upon the map amongst the landed proprietors, show how large an interest British capitalists have acquired in that part of the world.

NORTH POLAR EXPEDITION.—Greenland.—After the great zeal which was manifested last year by the Council of our Society, and by numerous Arctic explorers of eminence, in favour of a searching expedition to determine the true condition of the region around the North Pole, it is mortifying to be under the necessity of stating that there is at present no prospect that such an enterprise will be undertaken. Every person experienced in Arctic voyages being of opinion that a well-found Government expedition alone could succeed (private enterprise being out of the question), the Royal Geographical Society took the lead in pressing upon Her Majesty's Government the desirability of completing those Arctic researches which had already so distinguished our country. Unfortunately, as we think, the Admiralty have been unwilling to listen to our appeal, though it was backed by the opinions of the Royal Society and all the Scientific Societies of the Metropolis, as well as by the Imperial Academy of St. Petersburg, and other foreign scientific Bodies in Europe and America. Nor has the project so creditably and energetically taken up by the Geographers of Germany, headed by Dr. Petermann, had a more favourable issue; the present unsettled and warlike state of that great country being hostile to any such enterprise.

In the mean time, and while hoping for a change in the opinions on this point only of those who so ably direct our naval affairs, I

must direct your attention to a project to explore the northern coast-line and interior of Greenland, which seems to me to call for your hearty good wishes. One of our younger associates, Mr. Edward Whymper, already distinguished by his courage and self-reliance in surmounting the highest peaks of the Alps, has conceived the bold project of penetrating along the surface of some of its glaciers into the interior of this snow-clad continent, being convinced, from the number of deer which sometimes find their way to the coast, that there are, here and there, well-grassed valleys and recesses. He also believes it possible to trace by land the extent of Greenland to the north, which you will recollect was one of the main geographical objects of our projected North Polar expedition. On application to our honoured associate Admiral Irminger, to provide Mr. Whymper with a suitable companion, I am happy to say that a well-trained Danish guide is ready at Copenhagen to join our traveller, who is determined to make a preliminary trip to Greenland next spring, and afterwards to endeavour to accomplish what no one before has ever thought of. This is truly the *ne plus ultra* of British Geographical adventure on the part of an individual!

AFRICA.—In a postscript to the last Address I had the gratification of announcing the arrival at Khartum of Mr. Samuel White Baker, after the completion of those arduous and extensive journeys in which he discovered that second great water-basin of the Nile to which he assigned the name of “Albert Nyanza.” Nothing which has happened since the foundation of this Society gave me greater satisfaction than that this devoted and high-minded traveller should have thus proved himself to be truly worthy of the medal which had previously been given to him, and received by his brother at a time when, indeed, we were not certain of ever seeing Mr. Baker again! But as we decreed our highest honour to him for the chivalrous spirit he had displayed in rushing to the rescue of Speke and Grant, and for that gallant endeavour—whatever might be the result—to complete the first outline survey of Central Equatorial Africa, so I naturally rejoiced the more when his efforts were crowned with such triumphant success. Since that time we have had from Mr. Baker himself an eloquent and vivid sketch of his explorations and of the difficulties which he and his devoted wife had gone through during their five years of pilgrimage; and referring you to our ‘Proceedings’ for an outline of his discoveries, I have now to announce the issue of his work, in two volumes, entitled ‘The Albert Nyanza, Great Basin of the Nile.’ This work, written

in an unaffected, clear, and vigorous style, and illustrated by singularly telling sketches, will, I doubt not, rivet the public attention, and be most widely circulated. I will now only advert to two of the many results of his intrepid and persevering researches. First, the verification of the accuracy of the positions determined by the astronomical observations of his lamented precursor, which is of vast importance, for it has blown to the winds the rival claims of others, and has proved the truthfulness of the data established by Speke.* Next, the realization of the existence and definition of the vast water-basin of the Luta Nzige, sketched out from native information by Speke; an event of the highest importance in the annals of African scientific research.

It is true that, in the days of Ptolemy, the Nile was described as flowing from two lakes, and afterwards, in the middle ages, it was so placed upon old maps; but, irrespective of these bodies of water being most erroneously laid down as to latitude (*i. e.* many degrees south of the equator), their true relations to each other and to the Nile were wholly unknown, for neither of them had ever been visited by an European. Any knowledge respecting them must, therefore, have been obtained from the natives or Arab merchants. In the old maps I refer to,† the two lakes are represented as being perfectly unconnected, each sending off long independent streams, which afterwards, and far to the north, unite and then form the Nile. Our modern British discoverers have shown that the Victoria Nyanza of Speke, lying at an altitude of 3740 feet above the sea, is united with the Albert Lake by discharging its surplus waters into that grand lower basin, which Baker has found to attain an altitude of 2720 feet only and therefore to lie 1020 feet below the upper lake, or Victoria Nyanza of Speke and Grant. On former occasions I have directed your special attention to the striking phenomenon of the long system of water-basins, lakes, and rivers flowing therefrom which prevails in the elevated plateau-ground of Central Africa. Many of these bodies of water lie, so far as we know, in shallow depressions, the

* I rejoice to announce that the obelisk for which many of us have subscribed, to be erected to the memory of the lamented Speke, will, by permission of the Queen, be shortly erected in one of the principal walks of Kensington Gardens.

† Maps in the library of the College "de Propaganda Fide" in Rome; also maps re-published by the late Mr. Hudson Gurney. See also this subject illustrated by our associate Mr. John Hogg, in his interesting treatise "On some old maps of Africa, in which the central Equatorial Lakes are laid down nearly in their true positions," published in the Transactions of the Royal Society of Literature, 1864.

edges of which extend into marshy lands. Now, the Albert Nyanza of Baker is a striking contrast to all such lakes; for this enormous body of water, estimated to be about as long as Scotland, is a deep excavation in hard granitic and other crystalline rocks. Looking to the simplicity and antiquity of the geological structure of Central Africa—as spoken of in my previous Addresses*—it is this result of the exploration of Mr. Baker, or this profound excavation in hard rock, which has most interested me, and must, I am sure, interest all my brother geologists as well as physical geographers. For, if this great depression in hard rocks be not due, as I think it is, either to natural conformation or to some of the great movements to which those rocks may have formerly been subjected, how else are we to account for its existence? I have previously shown, from the absence of all marine deposits of tertiary and detrital age, that Central Africa has not been submerged in any of those geological periods during which we have such visible and clear proofs of great subsidences, elevations, and denudations in other quarters of the globe. Hence we cannot look to the sea as a denuding power in Central Africa. Still more impossible is it to seek in the existence of former glaciers an excavative power; for here, under the equator, not only can no such phenomena have occurred, but even if the application of such a theory were possible, it would be set aside by the fact of the entire absence, in Central Africa, of any of those moraines or transported débris which are the invariable accompaniments of glaciers, or the erratic blocks transported by former icebergs.

The discoveries, therefore, of Mr. Baker, which show that the vast lake of Albert Nyanza lies in a deep hollow subtended by mountains of hornblendic gneiss, quartz and porphyry, is an admirable datum for geologists to rely upon, who, whether looking to the physical geography and outlines of Central Africa, or to its extremely simple geological structure, are fairly enabled to refer this great variation of outline either to the original devious evolutions of great masses of molten matter, or to some great ancient movements of dislocation among very ancient metamorphic strata. In short, Central Africa presents no existing denuding agent which, if it operated for millions of years, could have excavated the enormous hollow in which the great Albert Nyanza lies.

* See the Addresses of 1852, p. cxxii; of 1857, p. clxvii; of 1858, p. ccviii; of 1859, p. clxxix; of 1863, p. clxxii; and particularly the Address of 1864, p. clxxxv, in which the geological as well as physical structure of Central Africa is sketched out.

Turning from Central Equatorial Africa to the West Coast, I again advert with pleasure to the zealous endeavours of M. du Chaillu, on which I spoke last year, to reach Central Africa from his old station near the mouth of the Fernand Vaz. Alas! you have now heard from himself how, by an untoward accident, he was prevented from reaching the heart of the loftier and higher mountains into which he was penetrating, making by the way numerous astronomical observations and photographing, as he went along, the scenery and costumes of the people. Correcting the outlines of his first map of these regions, which he had rapidly constructed without any real survey, he made his bold and highly adventurous journey into the interior, accompanied by a few faithful coast natives only. From Olenda in the Ashira country, which he visited on his former journey, he made an excursion northward to the Samba Nagoshi Falls, the correct position of which he has thereby determined, and afterwards diverging from his former route, he continued his journey eastward, and reached the village of Mooao Komba, 440 miles distant by his line of march from the western coast. I feel convinced that but for the unlucky accident which caused the natives to rise upon him he would have realised those expectations to which I gave expression at our last Anniversary.

When his whole narrative is published (including a vivid picture of his disasters and escape), I am sure the public will see in it the evidences of much patient research and lively observation; indeed, I know that the points in natural history which he announced, after his former journey, as original, but which were discredited by some persons, have been confirmed by Professor Owen and others, who have since examined actual specimens of the very animals the existence or nature of which had been doubted.

It therefore gave me great satisfaction when the Council adjudicated to M. du Chaillu a sum of money not merely to compensate him for the loss of instruments, which he had provided at his own cost, but as a testimonial of their approval of the energy and fidelity with which he had endeavoured to realise his bold and gigantic project. In the mean time, through his very numerous astronomical observations, he has fixed many positions over a tract of country previously unknown, which we may designate as "Du Chaillu's Land."

Northward of Du Chaillu's route another traveller, Mr. R. B. N. Walker, is now endeavouring to penetrate into the interior, under the auspices of our Society. After a long delay on the coast, he

proceeded on his journey in December last with supplies which will enable him to remain a year in the interior. His object is to reach, if possible, a large lake, or chain of lakes, reported to exist about 500 miles east of the Gaboon.

Some years ago much interest was excited in the travels of a Hungarian gentleman, M. Ladislaus Magyar, who announced, in letters published in Hungary and in Petermann's 'Mittheilungen,' that he had penetrated into the interior of Africa from Benguela as far as 27° E. longitude, and a brief account of his explorations was published in the 24th volume of our Journal. My attention has recently been drawn by his accomplished countryman, Dr. Rónay, to the published work of this traveller, the first volume of which appeared in 1859 at Pesth, in the Hungarian language, under the editorship of M. Hunfalvy János. This volume comprises only the early portion of his travels, between the coast and 19° E. longitude, during which the traveller married the daughter of the powerful chief of the Bihé country. In subsequent expeditions, the narrative of which was to have formed two other volumes, he advanced much further to the north-east and south-east, and visited previously unknown regions north and south of Livingstone's line of march in his famous journey between the Makololo country and Loanda. It is now more than five years since he sent home the manuscript of his first volume; and he then stated that it would be followed by the second, which at the time he wrote was nearly finished. Since then nothing more has been heard of him; and his friends having applied in vain to the Portuguese Government for information, it is feared that he has perished.

A comparison of the results of these explorations, as far as they have been published, with those of Dr. Livingstone has already been entered into by Dr. Petermann and other writers. My object in now introducing the subject is to record that Dr. Rónay, having given me an analysis of the first volume of these travels, states that although Ladislaus Magyar was very careful in giving the degrees of latitude and longitude and the elevations above the level of the sea, and says that he used instruments, he does not specify their nature. In so remarkable a series of journeys the absence of full information on these points is a great defect, especially as the first sketch of his travels, published, as I have before stated, in our Journal, was considered, by the able critical geographer, Mr. Cooley, in the commentary appended to the paper, to be very doubtful as

regards the geographical positions. The narrative, however, is full of interesting observations concerning the manners and political and religious institutions of the people, visited by a traveller who spoke their language and lived amongst them almost as a native.

Of the melancholy termination of the well-found expedition of the intrepid Baron C. von der Decken, from which so much was anticipated, notice has already been taken in treating of the career of that distinguished traveller, with whose death we must, I fear, abandon all hope of ever reaching Central Africa, or the countries watered by the Nile, by first passing through the Somauli countries and then through a region inhabited by the more savage Gallas.

With brighter hope I turn to the prospects of the sagacious and energetic Livingstone. Cordially received and supported at Bombay, he proceeded to Zanzibar, where he has the assistance of the Sultan, and from whence his expedition will be directed, as I announced last year, to the Rovuma River. After ascending that stream he will first determine the course of the waters between his own Lake Nyassa and the Tanganyika of Burton and Speke. Next, if he can reach the latter, and, after building a boat on it, is able to proceed to its northern end, he will at once settle the agitated question whether this lake be really, as some suggest, the ultimate southern water-basin of the Nile. If it should prove to be so, it follows that the altitude of Tanganyika, as given (by a bad instrument it is true) by Burton and Speke, was very erroneous, for by their measurement it was more than 800 feet below the level of the Albert Nyanza as fixed by Baker.

It is a circumstance of true gratification to me to know that Dr. Kirk, the tried and valued associate of Livingstone, should recently have been appointed the Government medical officer to the Resident at Zanzibar; so that in the absence of the Consul he will have ample opportunity of succouring his old leader, now the accredited Envoy to all the chiefs of Inner Africa. Dr. Kirk has also received authority from the Foreign Office to take every feasible step to obtain the release of the captives—if such there be—consisting of the crew and passengers of the *St. Abbs* Indiaman, the account of the shipwreck of which vessel on the Somauli coast was recently brought before the Society in a very telling manner by Colonel Rigby, formerly Consul at Zanzibar, and who was the zealous supporter of both the great African expeditions, which proceeded from that island.

Just after I had written the preceding lines, I learned with great

satisfaction, through a letter from Dr. Livingstone, of the 24th March, to his daughter, that he had reached the mouth of the Rovuma River in an Arab dhow, with his followers, and six camels, three asses, and three buffaloes. As it was found impracticable to ascend the Rovuma with the vessel, or disembark the animals on its banks, the party was taken on by Lieut. Garforth, R.N., to Mikeridamy, a fine harbour to the north of the Rovuma, where they were about to land when the letter was despatched. As the people of that tract are under the control of the Sultan of Zanzibar, with whose protection Livingstone is fully provided, and as the route is said to be open to the Lake Nyassa, our self-reliant and energetic envoy writes in the full persuasion that, with time and prudence, he will not only reach the watershed between Nyassa and Tanganyika, but be able to settle the question as to the elevation and drainage of the latter.

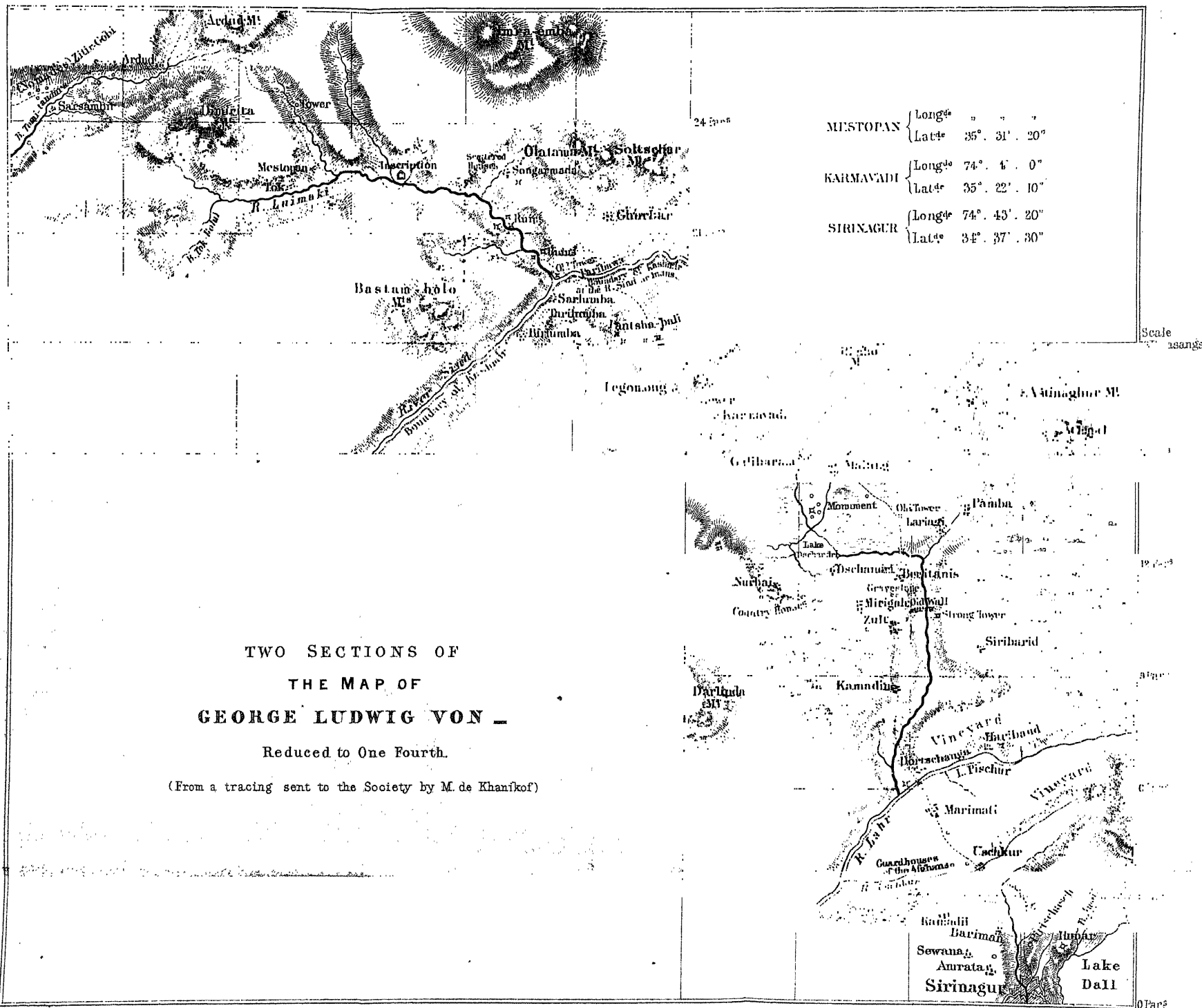
Conclusion.—This Address has now reached a length beyond that within which it was my wish to confine it, chiefly through the lamentable fact that several of our most eminent associates have passed away since our last anniversary; for you will doubtless all approve of my efforts, imperfect as they may have been, to do justice to their various merits. I have had also to dwell on the brilliant discovery of Baker, the meritorious explorations of the Purus by Chandless, on the recent great opening out of Northern or Inter-tropical Australia, on the admirable progress of the Surveys of Northern India, and various other topics of deep interest to us all. But, far from diminishing our anticipations, each of these advances in distant lands has but laid open new vistas, which invite the enterprise of future travellers; whether it be in Africa, Central Asia, South America, or Australia, to say nothing of the untrodden interior of New Guinea.

So long as such fields of research remain, the Englishman of our day, and of the future, will, I doubt not, strive to penetrate unknown countries as ardently as his ancestors did in the days of a Raleigh or a Drake. It is, indeed, the high opinion which our countrymen entertain of any one who thus boldly adventures on the search after fresh knowledge, which is the mainspring of the continuous and advancing prosperity of the Royal Geographical Society.

Let us, therefore, be of good heart when we look to the coming year, at the close of which, and on the termination of my duties as

your President, I feel confident, that if I then be among you, I shall have to congratulate you once more on uninterrupted success and new triumphs, and that it will only then remain for me to take leave of you with the hopeful watchword of all true geographers, "Forward, ever Forward."

POSTSCRIPT.—*Meteorology*.—In the rapid and necessarily imperfect sketch given at p. 223 of the history of the recent advances in Meteorology, there are errors which call for correction. It ought to have been mentioned that the first great advance in Land Meteorology originated really in a joint recommendation of the Royal Society and British Association in 1839-40, in pursuance of which observations were carried into effect, at various points of the British Dominions, on a most extensive and systematic plan, and that the continuance and extension of the system was the special object of a Meteorological Congress which assembled at Cambridge in 1845, and which had a vast influence on the advance of the Statistics of Land Meteorology. With regard to Ocean Meteorology few but those who are occupied with such questions are aware of the great services rendered to this branch of science by General Sabine, the far-seeing President of the Royal Society, who, on the part of that body conducted a correspondence with the different departments of Government in 1852, and especially in 1855, which formed an epoch in Meteorological science.



PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

[ISSUED NOVEMBER 10TH, 1866.]

SESSION 1865-66.

Thirteenth Meeting, 11th June, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT,
in the Chair.*

PRESENTATION.—*R. R. Glover, Esq.*

ELECTIONS.—*Bruce Brine, Esq., Lieut. R.E.; Augustus F. Gore, Esq.; Charles G. Heathcote, Esq.; James Kitson, Esq., Jun.; Richard Levinge Swift, Esq.; Charles C. Plowden, Esq.; Major Robert Stuart; Thomas Wilkinson, Esq.*

ACCESSIONS TO THE LIBRARY SINCE MAY 14th, 1866.—‘The Albert Nyanza: Great Basin of the Nile, and Explorations of the Nile Sources,’ by S. W. Baker, Esq., M.A., &c. ‘Report on the Tinnevely Pearl Fisheries,’ by C. R. Markham, Esq., Sec. R.G.S., &c. ‘Le Livre de Marco Polo,’ par M. Pauthier. ‘The Geography of New South Wales,’ by W. Wilkins. ‘The principal Ruins of Asia Minor described and illustrated,’ by C. Texier and R. P. Pullan. ‘On the Jostedal-Bræ Glaciers in Norway, with some General Remarks,’ by C. M. Doughty, Esq. ‘Reisen durch Chile und die Westlichen Provinzen Argentinien,’ von August Kahl. All presented by the authors. ‘Meteorology of India, an Analysis of the Physical Condition of India, Turkistan, the Himalaya, and Western Thibet,’ by Hermann de Schlagintweit Sakunlunski; presented by the India Office. Continuations of Journals, Periodicals, &c.

ACCESSIONS TO MAP-ROOM SINCE MAY 14th.—Atlas of India and High Asia, sketches by H. and R. von Schlagintweit; presented by the India Office. Admiralty Chart of the South Pole, showing icebergs. Sketches of the Pulni Mountains and Shevaroy Hills in

the Madras Presidency, on 24 sheets, presented by the Indian Office; by Major D. Hamilton. Map of Les Monts Maudits in the Pyrenees.

The PRESIDENT said he had much pleasure in announcing that the Council had this day elected his Royal Highness the Duke of Edinburgh an Honorary Fellow of the Society. His Highness had been himself a traveller in distant regions, and was well qualified to appreciate the labours of the Society. The members would learn with great satisfaction that he had expressed his sincere pleasure in becoming one of them.

The following Papers were read:—

1. *On the Effect of the Destruction of Forests, in the Western Ghauts of India, on the Water Supply.* By C. R. MARKHAM, Esq., F.R.G.S.

THIS paper contained the results of observations made by the author during a recent visit to the chinchona plantations on the Neelgherries and other mountains of Southern India. These mountain districts contain the sources of a water-supply on which the prosperity—indeed, the very existence—of millions depends. The most northern part of the range is comprised in the two Mysore districts of Nuggur and Munjerabad, and it is continued through Coorg, Wynaad, and the Neelgherries to the remarkable gap at Palghat, which enables the railroad to pass from sea to sea, and beyond the gap comprises the Anamallay, Pulney, and Travancore hills. The rainfall along this range is derived almost exclusively from the South-west Monsoon between May and September, but the amount decreases as Cape Comorin is approached. Near Bombay it is 248 inches, while at the capital of Travancore it is 65, and at the Cape only 30 inches. The clouds heavily charged with moisture from the Indian Ocean part with it on first entering the colder stratum caused by the mountains, the rainfall sensibly diminishing eastward across the plateaux, and being curiously affected by the smallest variations of aspect and shelter. Within the last 20 years a great change has come over these forest-clad mountain districts, in the establishment of many English planters, who have brought great material blessings to the natives, but, in the extensive clearings of trees which they have necessarily made, have brought about a deterioration of the climate. In all, a total area of 180,000 acres of forest has been cleared for coffee, tea, and chinchona plantations. One effect of this has been the occurrence of sudden floods, which have increased yearly in volume and destructiveness. There is a system of forest conservancy in the Madras Presidency, and the present superintendent, Dr. Cleghorn, is a zealous and able man, but Mr. Markham did not advocate Government interference with the development of plantations; he looked for help rather to the formation of reservoirs

in the hill districts to regulate the supply of moisture to the great plains in the East, which depend for their habitability on their rivers and irrigation works, fed by the mountain rains. The chin-chona plantations, when grown up, would compensate to a great degree for the destruction of the forests, the shade of the trees preserving the moisture beneath them. The storing of water in reservoirs can be effected at about the rate of 100% of capital for a million cubic yards of contents, besides what would be drawn off and again replaced during the monsoon.

The paper will be printed in the Journal, Vol. xxxvi.

THE PRESIDENT, in returning the thanks of the Society to Mr. Markham, said the subject was one of very great interest to all physical geographers. It was a subject upon which he had himself much reflected in reference to other countries, even our own country; for, owing to the improvements in agriculture and increased drainage, a decrease in the volume of our rivers had become plainly perceptible. He was happy to see many gentlemen present connected with India; and he would, in the first instance, call upon Sir William Denison, late Governor of Madras, to offer some observations upon the subject. Under his able administration some of those very operations had been undertaken to which Mr. Markham had alluded. He might add that Sir William Denison had become a Member of Council of the Society.

SIR WILLIAM DENISON said he would narrate a few observations which he had made with respect to particular localities in the territory of Madras, which would illustrate the subject that Mr. Markham had brought forward. The Western Ghats terminated by a block of hills, called the Neilgherries, rising to an altitude of about 7000 or 8000 feet. South of this there was a gap, about 40 miles wide, rising about 1000 feet above the level of the sea. Then came the Annamallay mountains, which rose to the height of 6000 feet. This gap is exposed to the full force of the Western Monsoon, and one would imagine that it ought to carry the great rainfall right into the very centre of India. In 1861, on his first visit to the west coast, he was much struck to find that for about 500 feet below the top of this 1000 feet the ground was as dry as a road; the railroad train, in descending the gradient, rushed from a brown dry desert country into a rich bamboo-jungle, as green and beautiful as possible. He asked the reason, and was told that the Western Monsoon terminated at the line of separation. You might almost stride across the division between green and brown, and have one side of you rained upon and the other not; at first he was disposed to consider the presence of the jungle as the effect of the rain of the monsoon, but a year or two afterwards, he happened to be conversing with the collector of the district, who said he had known the limit of the rainfall recede seven miles in consequence of the forest having been cleared away; and he then found out that the jungle was the cause of the rainfall. The same thing was proceeding in more or less degree throughout all India. When the native wanted fuel he cut down a tree without the least hesitation, and no one ever dreamt of planting a tree unless it were a fruit-tree. In this way the whole country was gradually laid bare. He had travelled for 600 miles in the Mysore and had never seen a tree except those that border the roads. Naturally enough no rain fell, and they were obliged to "bottle up" every drop of rain they could possibly collect. In every valley there was dam after dam in connection with the minor streams. Among the larger streams there was yet a great deal to be done by damming

the waters of the heavy monsoon rains, to be let out in small quantities, as required, for the benefit of the country.

General G. BALFOUR said he rose with great pleasure to bear testimony to the great services which Mr. Markham had rendered to India. After having introduced into that country the chinchona-plant, which there was no doubt would prove of great benefit, he had visited India a second time in order to examine the result of his former labours, and had brought back some exceedingly useful ideas upon an important subject. Forty years ago, as a member of the Public Works Commission, he himself had called attention to the influence which water had on the prosperity of the country; and many years ago his brother prepared two excellent Reports for the Madras Government, in which he urged with great force the importance of preserving the trees. The great tract of country which Mr. Markham had mentioned—an area greater than that of Ireland—is almost destitute of water, in consequence of the destruction of the trees. He hoped, however, that a change was about to take place. He could himself speak to the great results which might be expected from the works of the Madras Irrigation Company. The value of water would be appreciated when it was known that irrigation more than quintupled the produce raised from the ground. With regard to the preservation of trees, he thought a great deal might be done in India. In the Punjab rewards were given to the cultivators of trees. In former times it was the practice of rich Hindoos to sink wells and plant tops of trees, no doubt for the purpose of catching water. In the Mauritius the Government had passed laws to prevent the cutting down of trees, and the result has been to secure an abundant rainfall.

Mr. J. CRAWFORD said no one could doubt that Mr. Markham had been a great public benefactor to India; but with respect to the clearing away of the forests being adverse to the progress of a community, he must differ from that gentleman. It was quite the reverse, and so much the better. The presence of immense forests had proved one of the greatest obstacles to the early civilisation of mankind. The prairies of North America and the pampas of South America formed the very best land for the uses of man, especially in North America. Again, Upper Hindostan was totally free from forest, there being nothing but cultivated orchards; and it was a better country than the Madras country, a very flourishing region, paying a large revenue and containing a far more dense population than the Madras country. With respect to the benefits conferred by irrigation, they were unquestionable. The people of Madras would not have become what they are had it not been for irrigation; in fact, the population of India had been created by irrigation. Then, again, Java was free from forest, and it was incomparably superior to all the other islands of the Indian Archipelago; more civilised, and more densely populated. He thought the coffee-plant as useful for cultivation and retaining the moisture of the surface as the chinchona-plant. To revert to the question of irrigation, he hoped it would succeed. In some places irrigation-works had paid 100 per cent., and there was abundant employment for capital.

Sir HENRY RAWLINSON wished to say a few words in reference to the value of forests in promoting rainfall. Java, or any tract of land close to a sea exposed to the monsoons, was not a fair criterion. Where there are trade-winds bringing constant periodical rains you will get a rainfall, whether there is forest or no forest; but in the case of inland plains, beyond the influence of the trade-winds and the periodical rains, there you will find the effect most marked and most certain. He had observed it in many cases, and had verified it by comparing the present state of countries with their past state, as recorded in history. Take, for instance, the great plains of Mesopotamia. In early times we know, from Assyrian sculptures and from history, they were covered with woods, so much so that in the campaign of Julian the Apostate the Roman soldiers passed

from one river to the other entirely under the shade of trees, without ever feeling a ray of the sun. At that time there were constant showers, and the country was not only fertile but the climate was agreeable. The Arabs, when they first looked upon the valley of the Tigris and Euphrates, called it the "Green Paradise," from its excessive fertility—a fertility caused by periodical rains. Now it was a burnt-up desert, and no rain at all falls for six months in the year, from the beginning of May to October, and when it falls in October, after the heats, it is not as a periodical rain, but simply a condensation of the vapour. The whole of Persia was another notorious example. That was formerly a thickly-populated and fertile country, with an agreeable climate and a constant rainfall. The clearing of forests there was a matter of history. They had disappeared to furnish charcoal to the inhabitants. Until the last few years there was no such thing as coal known in the country. The more the people had become civilised the more they had required fuel, and the forests were disappearing year after year. It was a matter patent to every traveller, and it was a principle in physical geography, that the desiccation of a country followed upon the disappearance of its forests. He heartily agreed with Mr. Crawford in one respect, namely, that the thanks of the Society were due to Mr. Markham for the public service he had rendered in naturalising the chinchona-plant in India.

Mr. TORRENS stated that for twenty-five years he had resided in the colony of South Australia. At the commencement of this period the great plain of Adelaide, extending 100 miles along the sea-board, and about 10 miles in width, was crossed in many places by belts of forests. While these forests remained intact they had a regular rainfall every summer. The hot winds, which prevailed extensively in that region, were invariably succeeded by heavy thunder-storms, bringing down copious falls of rain, and these enabled the people to cultivate the melon, the pumpkin, and a great variety of plants, which they had since been compelled to abandon. The belts of wooded land were found to be exceedingly fertile, and the timber was cut down recklessly and thoughtlessly: the result had been that during the last fifteen years these heavy summer rains had entirely disappeared.

The President thought, from the discussion which had taken place, that Mr. Markham had well established his point. In his Annual Address he (the President) had referred to the transportation of the chinchona-plant to India, and the great public service which Mr. Markham had rendered.

SIR WILLIAM DENISON, interposing, said he could testify, from his own experience, that the cultivation of the chinchona-plant had succeeded most admirably, and was likely to be productive of very great benefit to India and the world at large.

The President said he had been asked by Mr. Markham to make some observations on the geological formation of Southern India, with reference to drainage. There could be no doubt that the gneiss of Central India was one of our most ancient, most crystalline, and most durable formations. That water should run off rapidly from rocks of that character was but natural, and it showed that the formation of tanks and dams in other parts of the country, which Sir William Denison had alluded to, was most desirable. He ventured to say that this fundamental rock, the backbone of India, was a primordial gneiss, showing that the continent of India was a very ancient one, and none of the other intermediate formations were found, as is the case in Europe. His opinion of the subject completely confirmed Mr. Markham, that if you deprive such a country of its trees, roots, and mosses, by which you hold water as it were in a sponge, the monsoon rainfall will necessarily run off in great and transient floods.

2. *Notices of Cathay.* By COLONEL H. YULE.

THE author stated that having been for some time past engaged, during the enforced leisure of a prolonged absence in the south of Europe, in preparing for the Hakluyt Society a collection of mediæval notices of China, he had been asked to turn his studies to account in the preparation of a paper on the subject for one of the Geographical Meetings. Papers of this kind were rare in our Journal, and, from better hands, might perhaps with advantage be introduced more frequently.

To those who had paid any attention to the subject, the mere use of the name "Cathay" would define the period with which it was meant to deal, namely, the 13th, 14th, and 15th centuries. The name itself—*Khitái*—though its European use may be considered as limited properly to those centuries, is to this day that by which China is known to nearly all the nations which are accustomed to view it from a landward point of view, including the Russians, the Persians, and the nations of Turkestan. The name was originally borrowed from the KHITANS, a people of Manchu lineage, who overran part of China, and adopted the manners of the conquered race; and it must have been during the period of their ascendancy, ending in 1123 A.D., that the name of Cathay became indissolubly associated with China.

On the rise of the Mongol power under Chinghiz, a century later, Asia was opened to the passage of Frank travellers. Among the many wanderers, dumb to posterity, who found their way to the far court of Kara Korum, luckily for us there went also, in the year 1245, John of Plano Carpini, a native of Umbria, and a few years later the Fleming, William Ruysbroek or Rubruquis, both of them Franciscans of superior intelligence, whose narratives have come down to us. First by these two, after centuries of oblivion, Europe was told of a great and civilized people dwelling in the extreme east, upon the shores of the ocean; and to the land of this people they gave a name now first heard in the West, that of *Cathay*.

A mere allusion must suffice to that illustrious Venetian family, whose travels occupy a large part of the interval between the mission of Rubruquis and the end of the 13th century. All other travellers to Cathay are but stars of a low magnitude beside the full orb of Marco Polo. There was a time when he fell into discredit, but that is long past, and his veracity and justness of observation still shine brighter under the recovery of lost and forgotten knowledge. Much as Marsden really did in his

splendid edition of Marco Polo, it would be no exaggeration to say that the illustrations of his narrative have been more than doubled since that day, from the stores of Chinese, Mongol, and Persian histories; and within the last few years Paris has sent out an edition of the traveller by M. Pauthier which leaves far behind anything previously accomplished. If there was anything to regret in this work it was that there was an acrimony displayed towards some of the editor's predecessors, such as Klaproth, which makes us outsiders marvel, and exclaim, "*Tantæne animis cœlestibus iræ?*" Wherefore should the language of the Celestial Empire have so bad an effect on the temper of its students?

Just as the three noble Venetians were reaching their native city, in 1295, the forerunner of a new band of travellers was entering Southern China. This was John of Monte Corvino, a Franciscan monk, who, already nearly 50 years of age, was plunging alone into that great ocean of Paganism, and of what he deemed little better, Nestorianism, to preach the Gospel according to his understanding of it. Others joined him, and the Catholic missions flourished under the patronage of the great Khan himself. Among the friars who visited China during the interval between the beginning of the 14th century and 1328, when John of Monte Corvino died, several have left letters or more extended accounts of their experiences in Cathay. Among these was Friar Odoric of Pordenone in Friuli.

The Exchange had its envoys to Cathay at this time as well as the Church, and many circumstances and incidental notices show how frequently both India and China were reached by European traders during the first half of the fourteenth century, a state of things very difficult to realize, when we see how all the more easterly of these regions, when re-opened only two centuries later, seemed almost as absolutely new discoveries as the empires which Cortes and Pizarro were annexing in the West.

The most distinct and notable evidence of the importance and frequency of this eastern trade was to be found in the work of Francis Balducci Pegolotti, a factor in the service of the great Florentine house of the Bardi—the house which gave a husband to Dante's Beatrice, and a heroine to George Eliott, in 'Romola.' This book, which was written in 1340, is a regular handbook of commerce, and the first two chapters are devoted to useful information for the merchant going to Cathay. The route lay from Tana or Azof to Sarai, the capital of the Kipchak branch of the house of Chinghiz on the Wolga, and thence by Astracan, Organj, and Otrar, near the Jaxartes, to Kancheu in Sucusi, and so forward to the Great Canal, which led

to the marts of Hangcheu and Peking. Particulars are given as to the investments and exchanges proper to this journey, and especially as to paper money, which alone was current in China.

This intercourse, both religious and commercial, probably continued till the fall of the Mongol dynasty. The latest detailed notice of it which we possess is that of the journey of John Marignolli, a Florentine friar, and it has been preserved for us in a manner sufficiently whimsical. Marignolli, after his return in 1353, seems to have acquired the favour of the Emperor Charles IV., who was King of Bohemia. He made the traveller one of his chaplains, took him to Prague, and desired him to recast the Annals of Bohemia. Charles would have shown a great deal more sense if he had directed him to put on paper a detailed narrative of his Eastern experiences. However, let us be thankful for what we have. The task was utterly repugnant to the Florentine churchman; he drew back from the thorny thickets and tangled brakes of Bohemian Chronicles, from the labyrinthine jungle of strange names, the very utterance of which was an impossibility to his Florentine tongue; and so he consoled himself, under the disagreeable duty imposed upon him, by interpolating his Chronicle, *à propos de bottes*, with the recollections of his Asiatic travels, and with the notions they had given him of Asiatic geography. Thus it is that we find these curious reminiscences imbedded in a totally unreadable Chronicle of Bohemia, just like unexpected fossils in a bank of mud.

Soon after the time of Marignolli, and of his contemporary the Moorish traveller, Ibn Batuta, the missions and merchants alike disappear from the field as the Mongol dynasty totters and comes down. The new rulers of China reverted to the old indigenous policy of holding foreigners at arms' length, whilst Islam recovered and extended its sway over Central Asia. A dark mist descends upon the further east, covering MANGI and CATHAY, with their cities, of which old travellers told such wonders—*Cambalec*, and *Cansay*, and *Zayton*, and *Chinkalán*; and when the veil rises before the Portuguese and Spanish explorers, nearly two centuries later, those names were heard no more. In their stead we have *China*, and *Peking*, *Hangcheu*, *Chincheu*, and *Canton*. Gradually Jesuit missionaries go forth again from Rome, new converts are made, and new vicariats constituted. But of the old converts no trace has come down.

Late in the sixteenth century, Jerome Xavier, a nephew of the great St. Francis, and himself a Jesuit missionary at the court of Akbar, met in the Great King's Durbar, at Lahore, a Mohammedan merchant, who had just arrived from Cathay. His account of the

country greatly excited Father Jerome, who saw in it an untouched and promising field for the labours of the Society. He strongly recommended his superiors to send a party to reconnoitre this country, in which he fancied that the long lost land of Prester John was at length to be revealed. The mission was resolved upon at Goa, and Benedict Goez, a lay coadjutor of the Society, and one of the noblest characters in the history of travel, was selected for the task. He travelled, in the character of an Armenian merchant, by way of Kabul, the high passes of the Bolor, Yarkand, Aksu, and Kamul, reaching the frontier of China at Kancheu in 1605. He had long come to the conclusion that the Cathay he was seeking was no other than China, but his endeavours to communicate with his brother Jesuits at Peking long failed. At last they succeeded, but a native convert who was sent to help him forward, arrived at Kancheu only to find Benedict on his death-bed. "Seeking Cathay, he found heaven." With him the curtain may drop on Cathay. China alone could be recognised thenceforward by reasonable people.

Returning to speak more particularly of some of the travellers who have been named, the first is Friar Odoric. Born about the year 1280, of a Bohemian family, settled in Friuli, he joined the Franciscans at an early age, and set out for the East, by way of Trebizond, Erzeroum, Tabreez, Soltania, Yend, and back towards Bagdad. Eventually he reached Ormuz, where he embarked for Tana, now a station of the Great Indian Peninsular Railway, near Bombay. He went on by sea to Malabar, Madras, Sumatra, Java, Cochin China, and Canton. He then visited Nankin, embarked on the Great Canal, and came by it to Peking, where he abode for three years. On his way homeward he passed through Thibet and Badakshan, returning to his native country in 1329.

The companion of Odoric, on a part at least of these long journeys, was Friar James, an Irishman. It was in May, 1330, whilst lying ill at the convent of St. Anthony, at Padua, that Odoric dictated his story, which was taken down in homely Latin by a brother monk, and in January, 1331, he died at Udiné, in his native province. He is now worshipped by the people, and his body is exhibited periodically to the eyes of the faithful. Colonel Yule had not seen it, but had visited his tomb, and the cottage where he was born, near Pordenone.

Odoric has been scouted as a liar, and even his brethren are reduced to plead character,—"so saintly a man would never have told lies, much less have sworn to them as Odoric has done." Some of his stories are certainly staggering, but many of them may be explained. Thus he alleges that he saw a tortoise as big as the dome

of St. Anthony at Padua, or at least 40 feet long. The friar, be it remembered, was lying ill in that convent when he dictated his story to brother William. He tells the latter, perhaps, that he saw an awfully big tortoise. "How big?" quoth William, all agape. "Was it as big as yonder dome?" "Well, yes," says the sick traveller, without turning his weary bones to look; "I dare say it might be," and so down it goes in regular narration. Several of the stories told by Odoric, of customs of the East, though long looked upon as travellers' tales, are really true. He gives, for instance, the earliest description of the well-known Chinese practice of fishing with tame cormorants, and his account is substantially identical with those of Fortune, and other modern travellers. Odoric also mentions the hill of sand on which he heard invisible kettle-drums; and here again we recognise the phenomenon of *Reg Rurcân*, or flowing sand, 40 miles north of Cabul, near the foot of the valley of the Panjshir. Burnes describes the same sounds heard there as loud and hollow, very like a large drum; and Wood says, the sound was that of a distant drum, mellowed by softer music.

Passing to another traveller, John Marignolli, the Papal Legate of 1338. He went, by way of Constantinople, to Caffa, then flourishing under the Genoese, and so, across Asia, to Peking, where his party had a most flattering reception from the last Chinese sovereign of the Mongol house. He then sailed for India, and arrived at Quilon, on the Malabar coast, in 1347; and afterwards set out, during the South-west Monsoon, to visit the shrine of St. Thomas, near Madras. He was afterwards shipwrecked on the coast of Ceylon, between Galle and Colombo, where he fell into the hands of a Musulman buccaneer, and was robbed of all his property, to the amount of nearly 120,000*l.* of our money. He eventually returned home by way of Ormuz, Mosul, and Jerusalem, reaching Avignon in 1353. He was not a sage, his garrulous reminiscences show an incontinent variety, and an incoherent lapse from one subject to another, matched by nothing in literature except the conversation of Mrs. Nickleby; but he was a man of considerable reading, and his recollections of what he had seen are often very vivid and graphic pictures, whilst his veracity is unimpeachable.

As a sample of the incoherency of some of his recollections may be given the following extract from his chapter "*Concerning the Clothing of our First Parents.*" It must be remembered that the book is a chronicle of Bohemia, to which such a subject of course legitimately belongs:—

"And the Lord made for Adam and his wife coats of skins and clothed them therewith.' But if it be asked, Whence the skins? the

answer usually made is either that they were expressly created (which savours not of wisdom!) or that an animal was slain for the purpose (and this is not satisfactory, seeing that 'tis believed the animals were created first in pairs, and there had been no time for the multiplication of the species). Now then, I say (but pray don't think I mean to dogmatise) that for *pelliceas* we should read *filiceas*; or for coats *fur* read coats *fibre*. For among the fronds of the coco-nut there grows a sort of fibrous web forming an open network of coarse dry filaments, and to this day among the people of Ceylon and India it is customary to make of those fibres wet-weather blankets for those rustics whom they call *camalls*, whose business it is to carry burdens, and also to carry men and women on their shoulders in palankins such as are mentioned in the Canticles, *Ferculum fecit sibi Salomon de lignis Libani*, whereby is meant a portable litter such as I used to be carried in when I was in India. A cloak, such as I mean, of this *camall* cloth (and not *camel* cloth) I wore till I got to Florence, where I left it in the sacristy of the Minor Friars. No doubt the raiment of John Baptist was of this kind. For as regards *camel's hair*, that is, next to silk, the softest stuff in the world, and never *could* have been meant. By the way (speaking of camels) I once found myself in company with an innumerable multitude of camels and their foals, in that immense desert by which you go down from Babylon of the Confusion, towards Egypt, by way of Damascus; and of Arabs also there was no end! Not that I am meaning to say there were any camels in Ceylon; no—but there were innumerable elephants. And these, though they be most ferocious monsters, scarcely ever do any harm to foreigners. I even rode on an elephant once, that belonged to the Queen of Saba! That beast really *did* seem to have the use of reason—if it were not contrary to the Faith to say such a thing."

While he was in Malabar, he tells us that he erected a stone as his landmark and memorial, and anointed it with oil. "In sooth," he adds, "it was a marble pillar with a stone cross upon it, intended to last until the world's end. And it had the Pope's arms and my own engraven upon it, with inscriptions both in Indian and Latin characters. I consecrated and blessed it in presence of an immense multitude of people; and I was carried on the shoulders of the chiefs in a palankin, like Solomon."

There is some reason to believe that this pillar survived to our own day. The Dutch chaplain Baldeus, writing in the latter part of the 17th century, says that—"Upon the rocks near the sea-shore of Quilon stands a stone pillar, erected there, as the inhabitants report, by St. Thomas. I saw this pillar in 1662." Three hundred years of tradition might easily swamp the dim memory of John the Legate in

that of Thomas the Apostle. Dr. Day, in his 'Land of the Perumals,' tells us that this pillar still exists; and Colonel Yule wished that this notice would lead some one on that coast to inquire about it.

The last of the travellers to be spoken of was Abu Abdallah Mahomed, surnamed Ibn Batuta, the traveller, *par excellence*, of the Arab nation. He was born at Tangiers in 1304. Between his starting on his first journey, at the age of 21, and his final settlement in his native land at the age of 51, his travels extended over a distance which amounted to at least 75,000 English miles. During the 30 years of his wanderings, he four times made the pilgrimage to Mecca, he traversed all Egypt twice, and both coasts of the Red Sea, he visited the eastern shores of Africa as far as Quilôa in 90° s., he several times visited Babylonia, he three times traversed Syria, was a short time at Constantinople, twice with Uzbeg Khan on the Wolga, he travelled across the steppes of Kharism to Bokhara, went through Khorassan to Kabul and Sind, and reached Delhi. The King of Delhi, Mohammed Tughlak, made him Kazi of the City, and eventually named him as Chief of an Embassy to China. He joined the Chinese junks which were about to sail from Calicut, and applied for a private cabin for the ladies who were with him. But the agent told him that the cabins were all taken by Chinese merchants, who apparently had return tickets, except one without fittings. So his baggage and ladies were put into it, while he stayed on shore to attend the Friday service, before embarking. Next day his servant came to say that the cabin was a wretched hole, and the Captain said they could have a smaller vessel, to which his ladies and luggage were accordingly transferred. Next day it came on to blow, the little vessel made sail, and our traveller was left on the beach at Calicut, gazing after them, with nothing left but his prayer-carpet, ten pieces of gold, and a slave, who immediately bolted.

During the next few years he wandered over the Maldives, Ceylon, and Medura, but eventually betook himself to Bengal, and thence to Sumatra and China. He returned to Fez, the capital of his native country, by way of Sumatra, Malabar, and Arabia, reaching home in 1349, after an absence of 24 years.

After all he had seen, he came to the conclusion that there is no country like his own West. "It is," says he, "the best of all countries. You have fruit in plenty, good meat and drink are easily come at, and in fact its blessings are so many that the poet has hit the mark when he sings—

'Of all the four quarters of Heaven, the best
(I'll prove it past question) is surely the West:
'Tis the West is the goal of the Sun's daily race;
'Tis the West that first shows you the Moon's silver face.'

"The dirhems of the West are but little ones, 'tis true, but then you get more for them."

Though Ibn Batuta sometimes exaggerates considerably, as when he says that the staircase of the Kutb Minar at Delhi is wide enough for elephants to ascend, he (Colonel Yule) did not know any charge of positive fiction that could be brought against him, except one or two doubtful cases in connection with his China voyage. He was not wanting in acuteness, nor in humane feeling, full of vital energy and enjoyment of life, infinite in curiosity, daring, restless, impulsive, sensual, inconsiderate and extravagant, doubtless an agreeable companion, for we always find him welcomed at first, but clinging; like one of the Ceylon leeches which he describes, when he found a full-blooded subject, and hence too apt to disgust his patrons.

The PRESIDENT said the work of Colonel Yule, about to be published by the Hakluyt Society, of which the paper was a mere summary, written to be read at one of our meetings, was of extreme value as a contribution to the history of geography. One of the authorities he had mentioned, Marignolli, was new to us. Colonel Yule was an officer of the highest distinction in the Indian service, and his 'Mission to the Court of Ava' was a well-known work. He was Secretary under Lord Canning's administration, and his services were highly valued by that great statesman.

LORD STRANGFORD said he thought the principle of alternating papers on geographical discovery with papers on geographical criticism like the present one, was a good one for the Society. Twenty-five years ago Major Rawlinson contributed to the Journal one of the most splendid papers of geographical criticism applied to archaeological enquiry that ever adorned the transactions of any Society. In this paper he displayed an enormous sweep of knowledge and the most acute critical judgment; but from that day to the present time they had received scarcely a single paper of this class. Colonel Yule had given quotations from two authorities, Ibn Batuta and Marignolli, and had revived the travels of several others. It was a long time since he had seen anything published on the travels of Benedict Goetz, but the journey of this Portuguese monk across the continent to Peking was a very remarkable one. With regard to Batuta, the information contained in the paper was not, strictly speaking, new. The work of Ibn Batuta had been translated into English by the late Professor Lee of Cambridge. It was twelve years since he (Lord Strangford) had seen that translation; but he could testify to his great delight in reading it, and also to the great value of Professor Lee's notes and commentaries. In the times of the Mongol domination Asia was thrown open to European travellers. These Mongol conquerors were men who professed the principle of tolerance, and they always courted European alliances for co-operations against the Mahomedans. That was the reason of their diplomatic relations with the Pope and with Louis of France. Afterwards the whole of Central Asia was hermetically sealed by the Timurian conquest, which represented the supremacy of Turkish Mahomedans of the fanatical type. During that period Europe had hardly any connexion with China, and it might be said there was a gap in our knowledge of Central Asia generally between the Mongol period and the subsequent discoveries of the Dutch and Portuguese. That vacuum had been supplied by some of these little-known travellers whose writings had been brought before the Society by Colonel Yule. Another traveller who might have been

incorporated into the account, as read to the meeting, was a Russian named Niktin, whose journals had been translated for the Hakluyt Society. It was a very curious work, and it contained many particulars which showed that this Niktin was strongly infected with M.

Mr. JOHN CRAWFORD said he had great pleasure in bearing testimony to the talents, diligence, and judicious mind of his friend Colonel Yule. Colonel Yule was Secretary to the present Commissioner of British Burmah, Colonel Phayre, when that able officer went on a mission to the Court of Ava, and he had published an account of it, twenty-five years after the one he (Mr. Crawford) had published—a similar work, but incomparably better than his own, and in which Colonel Yule corrected many of his mistakes and added many new facts.

Fourteenth Meeting, June 25th, 1866.

SIR RODERICK I. MURCHISON, BART., K.C.B., President,
in the Chair.

PRESENTATIONS.—*George Goodall, Esq.; Dr. H. C. Barnett.*

ELECTIONS.—*John H. Batten, Esq. (BENGAL CIVIL SERVICE); Lieut.-Colonel Lionel Seymour Dawson Damer; Capt. Henry Chas. G. Dugdale (RIFLE BRIGADE); John Gibson, Esq.; Berkeley Hill, Esq.; Charles Kean, Esq.; Vice-Admiral Sir Alex. Milne, K.C.B.; W. H. Ray, Esq.; John Scott, Esq., M.D.*

ACCESSIONS TO THE LIBRARY.—‘The Sportsman and Naturalist in Canada,’ by Major W. Ross King. ‘Von den Alpen,’ by C. von Sonklar. ‘Die Gebirgsgruppe der Hohen-Tauern,’ by C. von Sonklar. All presented by their respective authors. ‘Cæsarea: or, an Account of Jersey; the greatest of the Islands remaining to the Crown of England of the ancient Duchy of Normandy,’ by P. Falle. ‘Researches into the Early History of Mankind,’ by E. B. Tylor. ‘The Land of Israel: a Journal of Travels in Palestine,’ by H. B. Tristram. ‘The Great Sahara,’ by H. B. Tristram. ‘Exodus of the Western Nations,’ by Viscount Bury, M.P., &c. All added to the Library by purchase. ‘A Treatise on the Police of the Metropolis,’ by P. Colquhoun, Esq. Presented by S. M. Drach, Esq. Continuations of Journals, Transactions, &c.

ACCESSIONS TO THE MAP-ROOM.—Outlined Map of the Madras Presidency, to illustrate the projects contained in the Budget for 1866-7. Irrigation Map of the Madras Presidency, compiled for the Secretary of State for India. Map of the Pearl-banks off Tuticorin and Trichendoor. All presented by C. R. Markham, Esq.

The Papers of the evening were as follows:—

1. *On the Tributaries of the Nile in Abyssinia.* By S. W. BAKER, Esq.,
Gold Medallist R.G.S.

ON 13th Nov. last I had the honour of reading a paper descriptive of the White Nile and its sources, including the discovery of the great lake Albert N'yanza. I have on this occasion to bring to your notice those important rivers of Abyssinia, which, totally different in their character, occupy so interesting a position in the basin of the Nile.

We have proved that the White Nile is the great stream that nourishes Egypt, during nine months of the dry season when the Abyssinian affluents are exhausted, and that the sources of that extraordinary river are concentrated in two great lakes upon the equator, which receive the drainage of lofty mountains, in a region of great rainfall extending over ten months of the year. Commencing as the Nile from these vast reservoirs, the river flows through ten degrees of flat marshes, and arrives at Khartoum, in lat. $15^{\circ} 30' N.$, as a stream emanating from morasses; the water impure, full of vegetable matter, distasteful to the palate, and unwholesome. At that point, in N. lat. $15^{\circ} 30'$, the White Nile is joined by the Blue Nile from Abyssinia, a river of mountain origin and accordingly of sweet and wholesome water: the effect of the junction of the two streams is the purification of the White Nile water; the main stream commences its course through sandy deserts, loses the vegetable matter brought down from the morasses, and continues northwards until it reaches N. lat. $17^{\circ} 37'$, where it is joined by its last tributary, the Atbara. This river is similar in character to the Blue Nile, but inferior in volume. Its importance, although secondary to the former, may be appreciated by the fact that it is the affluent which carries the entire drainage of Eastern Abyssinia to the Nile. From its point of junction, the Nile flows unaided by other tributaries through upwards of fourteen degrees of latitude, or, allowing for the winding of the river, about 1100 miles, through deserts of burning sand, until it meets the Mediterranean.

The junction of the Atbara with the Nile is the point at which the volume of the Nile is at its maximum, as the last of the tributaries has been received; from that point the river loses from absorption and evaporation on its passage through the Nubian deserts.

Upon my arrival from Cairo at the Atbara Junction on the 13th June, 1861, I was so interested with its character, that I determined to devote myself to the examination of the Abyssinian affluents before I commenced the White Nile expedition. At that

time I stood among the dome-palms upon the banks of the broad Atbara, yet vainly looked for a river. Through the interminable desert that extends from Cairo to that spot, not one drop of water flowed into the Nile; and the great Atbara, whose bed was upwards of 400 yards in width, was no longer a tributary, but was a sheet of glaring sand—a desert highway for the torrents of the rainy season.

The banks of this dry watercourse were about 30 feet in depth. A narrow belt of dome-palms and mimosas fringed the margin, beyond which all was desert; the same inhospitable solitude that characterizes the Sahara. Through this the thread of green foliage marked the river's course along the yellow dreary desert.

My route lay on the bank of the river for about 180 miles to Gozerajup. Throughout this great length of its course there was no change,—the same glaring bed of sand, steep banks fringed with trees; while at intervals a deep bend in the river's course broke the monotony of its desert-bed by forming pools, from a quarter of a mile to a mile in length. Confined in these comparatively small pools were all the inhabitants of the river, which, free in the great flood during the rainy season, were prisoners during the dry months in a narrow space until released by the rising of the waters.

It is difficult to describe the extraordinary number of living creatures thus crowded together in these deep but insignificant pools,—immense crocodiles, turtles, fish of monstrous size; and in the largest pool a herd of hippopotami added to the general congregation. This spot was Collololāb. The position was occupied by the Bishareen Arabs, who, with their flocks, had sought this welcome watering-place, and fed their famishing goats by shaking the seed-pods from the mimosas with long crooks; the seed was oily and very similar to linseed, and was greedily devoured by the animals in the total absence of green-food. The few cattle they possessed were fed upon the nuts of the dome-palm. These are in great abundance throughout the desert course of the Atbara, and support both man and beast when other supplies fail. This species of palm produces about two hundred nuts, the size of an orange, but of an oval shape. To prepare it for food, the exterior portion, which is perfectly hard and polished, is bruised between stones, and detached from the shell of the nut in the form of a brown resinous powder; this is ground into flour, boiled into a porridge, and eaten with milk; the flavour resembles gingerbread. The interior shell of the nut, divested of its outer coating, is about the size of a goose's egg; this is broken, and produces a kernel, which is known in Europe as vegetable ivory: this is roasted in large piles, then soaked in water,

and pounded in a mortar as food for cattle. In that desert land, the unfortunate cows have nothing but nuts to crack during the dry season, when the scant vegetation produced by a few showers that constitute the rainy season has been withered and devoured. The supply of milk (the Arab's luxury) is accordingly most limited. The only saviour of the country is the Atbara: the fringe of dome-palms and mimosas on its margin is the asylum for the Arab tribes who during the season of rain inhabit the desert, but who depend upon the scanty produce of the river for their existence during eight months of burning drought.

In desert countries all tribes are nomadic, not from choice, but from necessity: the changes produced by seasons necessitate changes of locality, as the barrenness of the land renders an immense surface necessary for the flocks.

On the 20th June, on my arrival at Collololab, at the camp of the Bishareen Arabs, I heard that a man had been recently killed by a hippopotamus; the hippopotamus had entered into partnership with the proprietor of a patch of water-melons by the water side, and had refused to quit. No fruit is better adapted for the mouth of a hippopotamus than a water-melon; this the animal was quite aware of, and he resented the intrusion of the Arab by catching him in his huge jaws and giving him a crunch, which dissolved the partnership. I accordingly had my first introduction to the hippopotami at that place. I found them very careless and independent. They had finished the patch of water-melons, as well as the proprietor: however, in about ten minutes I shot two, to the great delight of the Arabs, who loaded about twelve camels with the flesh, sufficient for many hundred men.

Not only were the pools of the Atbara the resort of the crowded inhabitants of the river, but they were the attractions to all birds and beasts of the desert that were compelled to travel immense distances to the only watering-place afforded throughout the Nubian desert: thus, sand-grouse arrived in thousands in early morning and evening; birds in great numbers, and of beautiful plumage, lived in the narrow woods that fringed the river; thousands of doves thronged the trees; while gazelles and wild asses--the only quadrupeds of the desert--visited the welcome pools of the Atbara.

The scene was to change. On the 23rd June, 1861, in the still night, at about 8 P.M., there was a sound like distant thunder. I had left some skulls of hippopotami to bleach upon the hot sand of the river's bed; my men rushed down the bank to save them; the river was coming down, and the rumbling noise grew louder as the stream advanced and invaded the hitherto desert bed. The flood

rushed forward, rolled over the isolated pool, and liberated the crowded inmates, and in a few minutes the Atbara was no longer a desert, but a noble river. On the following morning the river was about 20 feet deep. In that spot it was about 500 yards wide, and a turbid flood was boiling onwards towards the Nile. The rains were pouring in Abyssinia.

We followed the banks of the river through the desert, and arrived opposite Gozerajup, the only permanent village throughout the long course of the Atbara, from the Nile junction. At that point there is a peculiar hill of naked granite-blocks of about 500 feet high, shaped like a pyramid. The desert now changed its character. From Cairo to this point it had been interminable sand and pebbles; but the sand had disappeared, and a rich soil, although void of vegetation, had taken its place. Fifty miles further south, we arrived at a most fertile country, abounding in rich grass, scattered with mimosas. Herds of several varieties of antelopes enlivened the scene, and Africa was no longer a desert. We had left the Atbara on the west, and we were now advancing towards Cassala, the capital of the Taka country. The interval between Gozerajup and Cassala was occupied by the Haddendowa Arabs.

Cassala is a large walled town belonging to the Egyptians, and garrisoned by about four regiments. It is the important station of the frontier, situated on the south bank of the river Gāsh (or Mareb). There is a peculiarity in this river that is a striking illustration of the power of absorption of the soil. The natural inclination of the country tends to the north-west, which would drain the Gāsh into the Atbara river; but although the stream is nearly 500 yards in width during the rains, it is exceedingly shallow (being seldom more than 3 feet deep), and is entirely absorbed by the soil before it can reach the Atbara. The water thus absorbed is discovered in wells 40 feet deep, half-way between Cassala and Gozerajup, at a village called Soogalup. In that spot the Haddendowa and Hallonga Arabs congregate with their flocks during the drought. Although perfectly dry during the hottest months, the Gāsh is an important torrent during the rains, bringing down the drainage of the Basé country and a portion of Eastern Abyssinia.

Leaving Cassala and the fine bare mountain of granite, which, upwards of 2000 feet in height, is seen from a great distance, I travelled west for 50 miles, through a flat fertile country, of park-like character, abounding in antelopes, until I again met the Atbara at Goorassé. The river had changed its character. Instead of flowing through a flat and sterile desert upon a level with its margin, it occupied the middle of a depression about 150 feet lower

than the adjacent country, which consisted of vast table-lands of rich soil, but suddenly broken into countless ravines for about a mile on either side of the river, forming a valley of about two miles in width, full of landslips, showing the effects of the rapid drainage of the surrounding country. At that time (the end of June) the rains had fairly commenced, and an immense volume of water was tearing down the river's bed, carrying the muddy wealth of the country to enrich the delta at Lower Egypt. I am of opinion that the Atbara carries down more mud than any other affluent of the Nile, owing to the rich character of the soil through which it passes until it enters the desert. The delta of Lower Egypt that has been actually created by the Nile does not owe its existence to the action of the White Nile, but entirely to the deposit from the fertile lands of Abyssinia, brought down principally by the Atbara river.

I crossed the river at Goorasé, where we were hospitably received by the great Sheikh Aboo Sinn, who gave us a good entertainment, and supplied us with camels—one of his grandsons acting as a guide south. Aboo Sinn is the grandest specimen of an Arab. He is about eighty years of age, but as hale as a man of fifty: he is about six feet three inches in height, stout in proportion, perfectly erect, and, with his long flowing white beard, he is a model of a desert patriarch. His children look as old as himself, and his descendants are as the sand of the desert. No sheik is so revered by all the tribes of Upper Egypt as Aboo Sinn, who, although by right the Sheikh of the Shookerēyas, has been nominated the head of all tribes under the jurisdiction of the Egyptian Government. The Arabs attribute the strength of his old age to his habit of drinking two pounds of melted butter daily. This may be a hint for English octogenarians.

Travelling south for four days from Goorasé, parallel with the left bank of the Atbara, I arrived at the village of Tomâte. At this point the grand river Settite effects a junction with the Atbara on the east side.

The Settite, known in Abyssinia as the Taccazzy, although an affluent of the Atbara, is *the river par excellence*, bringing down almost the entire drainage of Eastern Abyssinia. It has the same character as the Atbara, flowing through its self-made valley, broken into innumerable low hills and ravines, and far below the level of the surrounding country. Unlike the Atbara, however, it flows throughout the year, but the stream is so reduced during the dry season, that it is fordable in many places.

The rains having rendered travelling impossible, I made my headquarters at Sofi until September; having made arrangements to

explore the Settite river and all other Abyssinian tributaries at the expiration of the wet season. The neighbourhood of Sofi partook of the general character of the country from Cassala, consisting of enormous tracts of table-land of extraordinary fertility.

But, notwithstanding the extreme richness of the soil, there is a serious drawback to cultivation on an extensive scale. In the month of June, at the commencement of the rains, the Arabs quit the country, and emigrate with their vast herds of camels and cattle to the desert at and beyond Gozerajup. At that time the country, barren in the drought, becomes a vivid-green, and affords unlimited pasturage. This annual migration of Arabs and their flocks from the fertile districts is owing to two causes. A peculiar fly appears, which destroys all domestic animals. This is not the T'setsé of South Africa, but a large fly the size of a wasp, with yellow, black, and white rings upon the body. These appear in swarms at the commencement of the rains, and the virulence of their bite is fatal to both camels and cattle.

Another natural difficulty of the fertile country is the swelling of the rich loam in the great rainfall that continues for three months. The country being flat, the drainage is slow, and the rich mould, absorbing a large amount of water, swells into a mud so deep and adhesive, that travelling with animals becomes impossible. Those few Arabs who live by cultivation send off their flocks, while they remain to sow their crops of dhurra, a species of giant millet. This, with the rudest cultivation, is exceedingly productive, owing to the extreme richness of the soil. An idea of the return may be formed from the number of grains produced upon one head that was an average specimen, from which I counted 4848 corns. Cotton is also grown in small quantities sufficient for the supply of rough cotton-cloth woven by the Arabs for their own use.

At this point—Sofi—the Atbara flows between cliffs of white sandstone, in which I found fine specimens of fossil trees. I built a hut about a hundred paces from the river, from which I had a fine view of the swollen torrent, rushing along at the rate of about five or six miles an hour, and carrying with it a mass of timber, bamboo, and the wreck of forests brought down by the swollen rivers of Abyssinia. Dead elephants were frequently seen hurrying with the stream—these had been drowned in attempting to cross a too powerful current. The appearance of such a prize was the signal for a rush of Arabs from a whole village into the rapid stream: swimming to intercept the carcass, they floated with it several miles down the river before it could be secured, and ended by fighting for a division.

The appearance of the fly that drove the cattle from the country had an extraordinary effect upon the wild animals. The junction of the Settite with the Atbara formed an angle which intercepted all wild animals travelling north to avoid the fly from the south: thus herds of game were driven into a *cul de sac*, their retreat being cut off by the deep rivers. The east bank of the Atbara, opposite Sofi, was uninhabited, as it was a portion of Abyssinia contested by the Egyptians; thus it became a nucleus for game driven from the south to that point by the fly. From my hut on the cliff I had a beautiful view of the opposite country, and on one occasion I saw elephants, giraffes, and varieties of antelopes on the same day without moving from my position. On the Sofi side, the west bank of the river, there was no game, but in one herd of giraffes upon the opposite side I counted 154.

There was apparently no possibility of crossing the river, which was quite 200 yards wide, about 40 feet deep, with a tremendous current; however, the daily temptation of herds of large game determined me, and a herd of 33 giraffes in sight could not be resisted. I therefore arranged an angarep (bedstead or stretcher), and having inflated six goat-skins, I lashed them in position; upon this raft I secured my large English sponging-bath that was my constant companion; in this I sat with a couple of rifles, while four hippopotamus hunters, who swam like fish, were harnessed by ropes to my raft: these fellows swam across, towing me like Neptune in his car. We were carried down about half a mile, whisked round in several whirlpools, and at length landed safely on the opposite side. A careful stalk circumvented the giraffes, and that evening I bagged two giraffes and a hartebeeste.

Having taken a fancy to the other side, I moved my establishment over the way. This transit occupied two days, and the baggage being landed, I committed my most precious valuables to the sponging bath, *i. e.* Mrs. Baker and my best rifles. There was no great danger in thus crossing, unless a crocodile should seize one of the inflated goat-skins, which happened a few days later near the same spot. However, Mrs. Baker went safely across, and I followed as the last of the party. We now camped on the other side, on a sandstone cliff; and in this spot I made my preparations for the exploration of the Abyssinian rivers.

The last rain was on 16th Sept. The wet season had commenced in the middle of June. The country was a vivid green—the grass on the fertile table-lands about nine feet high; the Atbara was full. From that day the river decreased, the intense sun dried the earth, the grass lost its bright green colour, and gradually turned to the

palest yellow, the north wind blew, and the torch applied to the parched herbage kindled a blaze that swept as wildfire throughout the country. The scene was changed, as though a pall of black velvet had covered the ground—the country was open, and we could travel.

The Arab flocks returned, the fly had departed, neither dew nor rain moistened the scorched soil, and the shade of a tree by day, and the star-lit heaven by night, were our only roofs.

With a party of Hamrān Arabs and a few attendants, including some hunters, we followed the banks of the beautiful Settite River into the uninhabited district of Abyssinia and the Basé country. The water of the Settite was beautifully clear, flowing through a deep broken valley in a bed of exceedingly hard, white sandstone and a conglomerate of large pebbles. The average width of the river was about 200 yards. At times it was contracted between frightful precipices; at others, it extended into wide reaches; the banks were invariably clothed with trees, including the tamarind, and sometimes the gigantic baobab (*Adansonia*); some of the latter measured nearly 50 feet in circumference.

The general character of the country was a rough broken valley of several miles in width, through which the river flowed, above which were the great flats of rich table-land diversified with trees and jungles. After four days' march upstream, we arrived in the hilly country at the Basé. The highest mountain was Allatookoora, about 6000 feet above the base. Continuing along the margin of the river, through this wild and beautiful country, we arrived at the great mountain-range of Abyssinia, from which issue the principal affluents of the Atbara. The Settite now flowed through a gorge between deep cliffs. The hills and mountains were of basalt and of granite; but, in many places, there were ranges of low hills formed entirely of white quartz, in some of which were small veins of galena.

This being the dry season, the trees throughout the country were as naked as those of England are during winter, the intense heat having thoroughly denuded them of foliage; the only verdure was on the banks of the river—there, the tamarind and the evergreen and dense nābbūk afforded shade and shelter for the wild animals, who, in these otherwise uninhabited regions, were the possessors of the land. The finest gum arabic, like balls of amber, glistened upon the stems of the thorny acacias; this valuable commodity was gathered by the antelopes, and by vast troops of the great dog-faced baboon, who were the only gum-collectors. Hundreds of baboons might be seen together deliberately searching for the treasure; the

mothers carrying their young upon their backs, and frequently boxing the urchin's ears for dismounting suddenly to snatch at a piece of gum that the parent coveted. The variety of game was most interesting; the river abounded in hippopotami, and, of course, crocodiles, &c.; while the shore afforded elephants, giraffes, buffaloes, rhinoceros, lions, leopards, hyenas, ten varieties of antelopes, and small game, such as guinea-fowl and francolin-partridge, in extraordinary numbers. All, except the elephant and giraffe, were collected in the vicinity of the river; those wary animals retreated to a great distance after drinking.

In this uninhabited country a human footprint on the sand by the river's side was a cause of conjecture, and instinctively brought the rifle upon full-cock. It was the hunting-ground of the hostile Basé, who, enemies to Abyssinians and Arabs, were ridden down by the latter and sabred whenever met. The origin of this extraordinary tribe has never been explained; they differ entirely from the surrounding nations, and hold by force of arms their wild country, secure in their impregnable fastnesses among the mountains. Unlike both Arabs and Abyssinians, they are black, with woolly hair, and speak a totally distinct language; although they cultivate to a certain extent, they live principally by the chase, being most dexterous hunters and trappers. The preservation of game is a tender subject in most countries, so that their quarrels with their neighbours the Hamrān Arabs, in the common hunting-ground, had ended in no quarter being given on either side. Being without fire-arms, they had fled on hearing that I was in their country, as they supposed that my party was Egyptian for the purpose of slave-hunting.

The Hamrān Arabs are their most dreaded enemies, as they are equally cunning and active as themselves, and the most extraordinary hunters I have ever seen; they attack and kill every animal with the sabre, including the elephant and the lion. I had with me a party of four brothers, who were celebrated sportsmen; thus, during some months employed in exploring and hunting throughout that country, I had opportunities of sharing in hunts that were, to my long experience in wild sports, entirely novel. The party for hunting should consist of four mounted men armed with the usual straight-bladed double-edged Arab broadsword: an elephant being discovered, he is hunted until he turns upon his pursuers. Having turned to bay, after several tremendous charges upon the hunters, which they have dexterously evaded, a man rides slowly up to the head of the elephant, while two of his comrades steal quietly behind him. No sooner does the elephant make his

rush upon the horse than his rider turns sharp away, and, looking behind him to be the judge of his own race, he reins in his horse so as to keep him within a few yards of the elephant's outstretched trunk. Absorbed with the idea of catching the flying horse, the elephant forgets his enemies in his rear. In full gallop, with wonderful agility, an Arab springs from his horse with naked sabre in hand, when close to the elephant's stern, and with a dexterous two-handed blow he at one cut severs the tendon of the heel, and in full charge the elephant is disabled and halts. As quick as lightning another cut severs the tendon of the other leg, and in about half an hour the elephant bleeds to death, thus actually killed with the sword. Accidents constantly occur when the tables are turned against the hunters, and, upon one occasion, my best man had his thigh broken by an elephant I had wounded.

In those countries life is of no great value, and in an attack upon the lion by three or four hunters, one man is generally either killed or mutilated, but the death of the lion is certain; when he springs upon one man, he immediately receives a cut across the back from a hunter who supports his comrade. One cut from an Arab broadsword, as sharp as a razor, severs the spine. Nothing is more admirable than the courage and dexterity of these Hamrān hunters. They ride down and hamstring the rhinoceros in full gallop; and, when hunting the giraffe, it is by no means an uncommon circumstance to kill five or six out of a herd. Their horses are invariably Abyssinian, seldom above 13 hands 2 inches, but hardy and active, with the great advantage of tough hoofs that have never worn a shoe. A good horse can be purchased for from ten to twenty dollars, —2*l.* to 4*l.*

Although Mahommedans, these mighty hunters, the Hamrān Arabs, are not particular as to their food. Accustomed to hunger and fatigue, they are contented with all game that falls to their lot; thus even the wild boar is eaten.

One day, after a feast upon a hog, I asked my Mussulman companions what their Faky or clergyman would say to their eating pork, as it was contrary to the Koran. "Oh!" they replied, "we have already consulted him: he says, 'Mind your Koran. If you have the book with you and *no* pig, don't eat pork; but if you have the pig, and no book, eat the pig!'"

These people have implicit faith in their Fakeers. In case of sickness they apply to the minister, and, in default of medicine, he writes upon a wooden slate a text from the Koran in ink; he then washes this off, and the inky water is administered to the patient, *upon payment*. The holy dose, if not effective, is repeated, together

with the fee, in a similar manner to "the draught as before" among ourselves.

Having explored the Settite, I crossed to the river Royān, another powerful torrent during the rains, rising in the mountains of Abyssinia, and tributary to the Settite; it was dry at this season, the bed having so rapid an inclination that it quickly runs out after the cessation of the rains in September. The water-mark on the banks was 9 feet above the bed, and the river being about 90 yards wide, a great volume of water is brought down by this rapid torrent. The junction with the Settite is an extraordinary spot; the Royān meets it with a great waterfall, which causes a frightful whirlpool about 400 yards in diameter, just below a narrow gorge, through which the Settite rushes close above the junction.

From this river I crossed the country to the territory of Mek Nimmur. As usual the soil was wonderfully fertile on the high table-lands, but poor among the mountains.

This Mek Nimmur was the son of the old Mek or Meleek (signifying King), who burnt Ismaen Pasha alive at Shendy. At that time the Turks were extending their rule in Upper Egypt, and Ismaen Pasha having arrived at Shendy on the Nile, a few days north of Khartoum, demanded supplies from the Arab Meleek to the amount of one thousand of every kind, including camels, cattle, &c. Accordingly the cunning Arab delivered 1000 camel-loads of straw as fodder, which he piled around the hut of the Turkish Pasha, and, setting fire to it during the night, he perished in the flames with many of his people. Mek Nimmur then fled to Abyssinia, and received from the king of that country not only a welcome but a portion of territory as a reward for his meritorious action. From that time Mek Nimmur and his sons have been at perpetual war with the Turks, constantly crossing the Atbara River during the dry season, and pillaging the country.

We were well received by this band of ruffians, and spent a week with them. I had taken the precaution beforehand to send him a polite message, accompanied by a present; and, upon our arrival, we found him a particularly agreeable robber, but rather dirty. The dirt was caused by the difficulty of washing, as the stream that supplied him with water flowed through a soil rich in copper. The effect of washing in this water produced a violent irritation on the skin; and, when I was first introduced to Mek Nimmur and a crowd of ruffians who surrounded him, they were all scratching vigorously.

I attribute much of Mek Nimmur's civility to the fact that I had introduced myself as a friend of an English traveller, who had

twenty years ago been hospitably received by his father, and who had acknowledged that hospitality in a work subsequently published under the title of 'Life in Abyssinia,' by Mansfield Parkyns.

It was a deep satisfaction to me, that the character left by an English gentleman in that wild country should have outlived so long a period. No European but Mr. Mansfield Parkyns had preceded me in Mek Nimmur's country, and the mere remembrance of his name was a favourable introduction.

On my arrival I camped under a tamarind-tree on the bank of a stream, while I sent a messenger to Mek Nimmur's abode. Shortly after, an Abyssinian arrived; he was Mek Nimmur's chief minstrel, gaily dressed in very tight white-cotton inexpressibles, a snow-white flowing robe, and mounted upon a white mule. He carried the peculiar long, curved Abyssinian sword, silver-mounted pistols, and was attended by a servant who carried an immense fiddle as large as a violincello, but having only one string. He dismounted, and in a long and loud song, with a fiddle accompaniment, he sung an impromptu ode upon my achievements in the Basé country, nearly all of which were fictions—"How we had been attacked by overpowering numbers, and how I had vanquished and slain the enemy, and rescued Mrs. Baker, who had been stolen away." This was very pretty, only not true; and a large present was expected, and obliged to be given for this display of minstrelsy.

About an hour after his departure, another greedy minstrel appeared, equally grand and imposing—a sort of second edition of the former. I positively declared against music, and, after vainly endeavouring to play his violin, which I threatened to break should he sound a note, he remounted his mule and descended the steep bank of the muddy stream to cross to the opposite side. The mule would not enter the water, fearing the deep mud; the attendant struck it behind, when a vigorous kick taking effect in the servant's chest threw him upon his back, while the same effort unhorsed the snow-white fiddler, who splashed head-first into the muddy stream. The mule dashed away at full speed, leaving the musician struggling in the brook, while his violincello floated on the surface. This was the "Lay of the last Minstrel:" we were relieved of the fiddlers, and my men burst into a chorus of laughter.

Mek Nimmur furnished me with a guide to the rivers Salaam and Angarep (or Angrab), two large torrents issuing from the great chain of lofty mountains about 20 miles distant. This splendid range of mountains has an average height of about 5000 feet, with peaks rising to about 8000 feet.

Crossing a beautiful park-like country, well watered by perennial

rivulets, we arrived at the Bahr Salaam about 30 miles distant, and continuing up the stream we pitched our camp upon the precipitous cliff above the pure stream of the Salaam at its junction with the river Angrab, of a precisely similar character.

The country was the perfection of scenery—the clear rippling stream, 100 feet below us, flowing now over pebbly shallows and between perpendicular cliffs, in immensely deep silent pools, where the hippopotami dwelt in undisturbed security. The lofty Abyssinian range of mountains was apparently close to us; bold rocky hills, cliffs, and rough undulations covered with splendid trees, formed the varied foreground. Unlike the parched country farther north, numerous rills trickled down the cliffs, the trees were green, and we felt the invigorating influence of the mountain-range from which the waters came. Above the valley of the river Salaam was the usual fertile table-land that characterises this country. All was uninhabited, the distrust occasioned by continual strife between the Abyssinians, the Turks, and Mek Nimmur, had rendered this beautiful country a deserted wilderness. I passed some weeks in hunting, and exploring the banks of the rivers Salaam and Angrab to the base of the high mountains from which they issue. The Salaam is the larger of the two, being about 160 yards broad, with an immense depth during the rainy season, as shown by the high water-mark upon the rocks. Although this was the height of the dry season (the middle of April), there was a fine stream rippling over the uneven bed of basalt rock after the junction of the Angrab, which flowed into the Atbara; nevertheless both this body of water and that of the Settite River are at that season unable to support the absorption of the sandy bed of the great river, and the Atbara below Gozerajup remains perfectly dry, its bed a desert of sand.

My guide deserted.

Having explored and hunted throughout this country, which was full of large game, I cut across towards Guddabi, guided by a mountain named Nahoot Guddabi, about 50 miles distant. Without either path or other guide, I was obliged to send a party, with camels and a large supply of water, in advance, to search for water on the road: I awaited their report, and then followed with the main party. It turned out that the country was well watered with small but perennial streams; thus we had no difficulty in travelling through the most lovely country that can be imagined, teeming with giraffes and antelopes, with a sprinkling of rhinoceros and elephants. We were well received by the Tokroori Sheikh at Guddabi in a romantic dell between the mountains, and on the following day, after a march through forest, we reached the Atbara River. At this point it was

merely about 80 yards wide, but a clear stream was running over its rocky bed; all of which, together with the larger supply from the Salaam and the Settite, was to be absorbed by the sand and evaporation before it could reach Gozerajup.

Although the Atbara is next to the Blue Nile in the volume it brings from Abyssinia, it is comparatively unimportant until it receives its great affluents the Salaam and Settite. Crossing the river, we entered, if possible, a still more beautiful country under the mountain Ras el Feel.* This was visited by Bruce, and most accurately described by him. We were now in hilly country of most fertile soil, well watered by many brooks; and although, in the countries passed through, the soil was parched and rent into innumerable fissures, here the first showers had fallen, attracted by the mountains, and the young grass was springing above the surface on the 18th April. The whole of this neighbourhood was well inhabited by the Tokrooris, a tribe of the distant country Darfur. We arrived at Gellabāt, or Metemma, the capital of the country; this is a miserable town situated in a valley among the hills, but, although insignificant in appearance, it is the market for the produce of Abyssinia, *en route* for the Egyptian provinces.

The market is held two days per week. Throngs of Abyssinian traders occupied temporary sheds filled with coffee, which they sold at the rate of a piastre, or 2½d. per lb. Coffee, bees'-wax and honey, prepared ox-hides, raw hides, &c., were the principal exports from Abyssinia, and cotton was purchased in return. Many hundred bales were exposed for sale, and were eagerly bought up for Abyssinia. It will naturally be asked from whence came the supply of cotton. It is produced by the Tokroori settlers.

As before mentioned, the Tokrooris are natives of Darfur; fine powerful blacks, something of the negro type, but differing from all in possessing the rare quality of industry. The Tokroori is the only African tribe that I have seen in whom I can discern a future.

These people in Darfur are governed by a Sultan, who prohibits Europeans, on pain of death, from entering his dominions. They are fanatical Mahommedans, and accordingly make pilgrimages to Mecca. During their long journey from Darfur to Souakim on the Red Sea, they passed through the country of Ras el Feel; and, allured by the richness of the locality that contrasts so favourably with the parched deserts of Darfur, they became settlers, and formed a colony that is ever increasing. There are now about 15,000 men located in the country, all of whom are industrious cultivators and

* "The Elephant's Head."

traders. The women work as well as the men, and are seldom idle. They grow cotton, spin yarn, weave cloth, and, were they encouraged, would shortly extend their settlement and cultivate on a large scale all that beautiful country that I have already described between the Settite and Gellabāt.

The encouragement given to these industrious emigrants may be imagined. Gellabāt is claimed by the Egyptian Government, although forming a portion of Abyssinia. The Tokrooris, having settled in that country, are claimed as subjects by both Governments, and they enjoy the advantage of double protection by *paying taxes on both sides*. The Turk has but one idea of government—extension of territory to increase the number of subjects, all of whom must be taxed—a most simple and practical idea that everybody *must* pay. The future never enters the head of a Turk. Good government of a population means oppression and taxation: the Arab's proverb, "The grass never grows in the footprint of a Turk," painfully expresses the desolation of Moslem progress.

Thus, under this miserable rule, rich lands lie in wilderness, and a population that might become prosperous and civilised is paralysed by oppression.

Abyssinia is celebrated for a superior breed of mules. The horses of Abyssinia are in great request among the Arabs, and a considerable number are brought to the market weekly. Leaving Gellabāt, we struck due west towards the river Rahad, about 50 miles distant; arriving there on foot, after the loss of two of my horses on the road through a sudden attack of inflammation, to which at this season they are subject. The Rahad is a small river, about 70 yards wide, flowing from Western Abyssinia through a dead flat of wonderfully rich soil. I met the river in about 12° 20' N. latitude, and continued along its margin for upwards of 100 miles, finding water in pools at intervals, the bed at that season being dry. I then crossed to the river Dinder—a river of similar character, but larger, and containing more water at this season. The banks were crowded by the Kunāna Arabs with their flocks, precisely as was the Atbara during the dry season. Both the banks of the Rahad and Dinder were cultivated at intervals; many permanent villages were surrounded by extensive tracts of dhurra, which was to be purchased for 10 piastres the rāchel—about 2s. per 500 lbs. weight—a sufficient proof of the extreme fertility of the soil. I shot some hippopotami in the Dinder, to the great delight of the Arabs, who attacked the carcasses like vultures, quarrelling, as usual, over the meat more like a pack of hyænas than human beings. Bruce was disbelieved for asserting that the Abyssinian

preferred raw flesh to cooked. Not only Abyssinians but the several tribes of Arabs and also the Tookrooris have no objection to raw flesh; and, should a sheep be killed, they will invariably steal and swallow the kidneys while they are cleaning the inside. Although good hunters, I found a great difficulty with my people; whenever I shot a large animal, they would never leave the body to look for another until they had enjoyed their most epicurean feast. The paunch was divested of its contents unwashed, then cut up in slices, hot and reeking from the animal, and over the pile a sauce was poured—the *gall from the gall-bag*! The party would then sit round the disgusting heap and swallow piece after piece, hurrying for the largest share. The gall appears to act in a peculiar manner upon the flesh, rendering it easy of digestion. A favourite dish is the raw lungs of an animal; but this is so tough and spongy as to be unmanageable until it has gone through a certain process. The gall is poured into the main orifice of the lungs, a man inflates the mass by blowing into the orifice; this drives the gall through all the air-vessels, and the lungs immediately change colour, become nearly white, and are perfectly tender—and fit to eat.

Following the Dinder, I crossed the Rahad at its junction with the Blue Nile near the town of Abou Harraz, and, continuing along its banks, I at length reached Khartoum, having been exactly twelve months from the day I had quitted Berber.

I had thus examined all the affluents to the Nile from Abyssinia—the Atbara, Settite, Royân, Salaam, Angrab, Rahab, Dinder—to the Blue Nile.

It was the 11th of June when I arrived at Khartoum, and the Blue Nile, although very low, was slightly but steadily increasing. It will now be interesting to observe the effect of the Abyssinian rivers upon the true Nile.

It was on the 23rd of June in the preceding year that the sudden flood poured down the dried bed of the Atbara river, caused, as we have now seen, by the heavy rains of Abyssinia at the commencement of the wet season that had flooded simultaneously the Settite and Salaam, together with the head of the Atbara. At the close of June, in the following year, while at Khartoum, I saw the Blue Nile rise from the same cause, *i. e.*, the rains in Abyssinia. Thus the Atbara and the Blue Nile rose simultaneously, bringing down the drainage of Abyssinia into the true Nile. The White or true Nile at that time was not full, but was daily increasing above Khartoum; but below the junction of the Atbara a great flood was pouring down the river caused by the excess of the Abyssinian rainfall rushing suddenly into the main stream of the Nile.

The inundation in Lower Egypt commences in July and continues till the end of September. Now the last day's rain when I was in Abyssinia was 16th September, at which date the wet season closed; thus the flood came down the Atbara on 23rd June, and the rain ceased on 16th September, while the inundation of Lower Egypt occupies a similar period, allowing a short extra time for the flood to reach that country and afterwards to retire.

Arrived at Khartoum, I commenced the necessary arrangements for the White Nile expedition that is now published. Fortunately, it proved successful; but, in spite of that success, I must confess that, although the Nile sources have been discovered, I should still have remained ignorant of the actual cause of the inundations of Lower Egypt had I not previously investigated the Nile tributaries from Abyssinia.

The White Nile, of lake origin, in an equatorial rainfall of ten months, keeps up the great volume of water that nourishes Egypt; but the Blue Nile and the Atbara, of mountain origin, with a short but tremendous rainfall of three months, rushing into the main river, cause the inundations of Lower Egypt, and to their influence is due the extreme fertility of the Delta.

The PRESIDENT said he heartily congratulated the Society upon the production of this paper. It would form a most valuable appendix to the remarkable work on the Albert Nyanza, which Mr. Baker had recently published—a work which was now eagerly perused throughout the land, and which would procure for him a reputation, as a writer, exceeding that of any African traveller since the days of Bruce. The present paper was equally worthy of him, and it was interesting alike to the naturalist, the ethnologist, and to the geographer. He might add, that Mr. Baker had placed in a clear light the relations of the Atbara and Blue River to the main stream of the Nile, and had shown by actual observation that it was to those affluents that the great river owed the rich sediment which, deposited by inundations, was the source of the fertility of Egypt. Before he called for any observations upon the paper, he would ask the Secretary to read a very interesting communication from Mr. Rassam, Her Majesty's Envoy to the Emperor of Abyssinia, which formed part of a letter he had written to Colonel Playfair.

2. *Extracts from a Letter of Mr. RASSAM to Colonel PLAYFAIR.*

MY DEAR PLAYFAIR,

Korata, Lake Tsána, 22 March, 1866.

In my last letter I informed you that I had received a letter from the Emperor, in which he asked me to come up *via* Kassala; and consequently I was obliged to go to Egypt for the necessary papers from the Egyptian Government to enable me to pass through Soudan. Towards the end of September, I found myself back in Massowah, accompanied by my old companions Dr. Blanc and

Mr. Prideaux. As ill-luck would have it, the cholera broke out soon after our arrival there, and a great number of deaths occurred daily in the island and the surrounding country; the people were terror-stricken, and you can fancy the difficulty we had to get any of our preparations made. The authorities, however, gave us all the assistance in their power, and we were enabled to start for Kassala, as I had intended, on the 15th of October. We had much difficulty on the road from want of sufficient carriage; nevertheless, we reached Kassala on the 6th of November. The Governor, on hearing of my approach, sent out a regiment of infantry and two squadrons of Bashi-Bazooks to meet me about a mile from the town. We found Kassala quite ruined, owing to the late mutiny of the Soudan troops. Most of the mutineers had been destroyed, and their wives and children taken captives by the authorities. It was said that 800 of the former and as many of the latter were in prison while we were at Kassala. What with the mutiny, cholera, and malignant fevers, the natives were almost destroyed. Not a grain of wheat or rice was to be obtained for months, and even the highest Turkish officials had to subsist on millet. In consequence of these misfortunes, we had great difficulty in obtaining camels for our luggage, as those we had brought from Massowah could not go further, and we were detained there four days.

After a journey of eleven days through a very hot region, we reached Matemmo, the residence of a negro chief who is obliged to pay tribute both to Abyssinia and Egypt. Thence I sent messengers to the Emperor, apprising him of my arrival at the frontier of his dominions, and, after waiting thirty-five days, I received a very courteous reply, welcoming me to his country, and informing me that he had issued orders to all his deputies, on my way to his Court, to afford me every assistance, and to supply me with provisions and carriage free of expense. These orders were carried out to the letter; everything was provided on the road on the most liberal scale, and sometimes our daily rations reached as high as 1000 loaves of bread, 2 cows, 20 fowls, 500 eggs, 10 jars of milk, as much honey, and abundance of sour milk, red pepper paste, &c. Our baggage was carried on men's shoulders all the way, and on starting we had no less than 1200 porters and a guard of 200 men and 5 officers. The country through which we passed was most beautiful; and it was no small pleasure to me, after my long residence in Aden, to ride through groves of wild rose and jasmine bushes.

After a month of slow marching and numerous halts, we reached the Emperor's camp at Damot, about 50 miles south of Lake Dembea.

This fortunate day, which I had been anticipating for more than a year and a half, was the 28th of January.

On hearing of my approach, his Majesty despatched a guard of honour to receive me, consisting of 300 officers of high rank, headed by the Prime Minister, who received me on foot, assured me that his master welcomed me most cordially to his country, and made many inquiries after my health. He then presented me with a fine mule, saddled and bridled, and said that his Majesty had sent it for me to ride on to his camp, at the same time apologising for the meanness of the gift, and saying that his Majesty hoped to make me a more suitable present hereafter.

We then mounted our animals and proceeded to the royal Court. The King was then on an expedition against the rebels of Gojam, and had an army estimated at 45,000 fighting-men, with as many male and female followers.

The Emperor had a tent of red cloth pitched for my reception; and, after having rested there for a couple of hours and eaten a good breakfast, sent to us from the royal kitchen, we were summoned to Court. The Emperor's tents were pitched on the summit of a hill, and ours were at the foot of it. A double street of musketeers was formed from our tents to the royal pavilion, and, as soon as we got within sight of the latter, the soldiers began to discharge their pieces, and continued to fire in regular order until we were ushered into the King's tent.

This was made entirely of silk and carpeted with the same material. His Majesty was reclining on a couch; on either side of him stood his ministers and the officers of the Court. I advanced, and presented the Queen's letter; and, after a few words of civility, we were invited to sit down, which we did, on the right hand of the Emperor. Her Majesty's letter was written in English, and, as there was no one present who could read that language, the Emperor laid it on the couch beside him, and, after making repeated inquiries as to our health and whether we had recovered from the fatigue of the journey, he commenced entering on a statement of his grievances and of everything that had taken place since he lost his favourite Englishmen, Plowden and Bell. . . .

The next morning his Majesty again sent for me, and to my inexpressible delight, informed me that, for the sake of my Queen, and to show his anxiety to retain her friendship, he had ordered the release of all the prisoners, and had directed them all to be made over to me to take with me out of the country. . . .

The next day his Majesty set out for the district of Meteha; we travelled with him for five days, after which my companions and I

set out for this place to await the arrival of the captives. The Emperor was extremely kind and courteous all the time we were with him. On one occasion he told me why he had not answered my letters sooner. "Because," said he, "since the death of Plowden and Bell, all the English and Franks who visited my country appeared insane, ill-mannered, and ill-tempered. I said to myself, 'I must not see this English agent till I see whether he is of the same temperament as those who created a breach between me and the Queen of England.' Your patience in waiting so long for an answer has convinced me of your worth; and now, as you have happily established a renewal of friendship between this country and England, I wish you to convey to your Queen and to her Council my anxiety to cultivate the friendship of England, which I have been longing for ever since I ascended the throne of Abyssinia."

The Emperor wished us to remain here till the arrival of the captives, and he sent to Debra Tabar for all the European artizans and their families to come and keep us company; so we muster quite a large party of Europeans.

Although the order for the release of the captives was given on the 29th of January, the distance is so great that they were not relieved from their fetters till the 24th ultimo; they all arrived in safety at this place on the 12th instant, and, with the exception of Cameron, who is somewhat weak, they are all in excellent health. They number 18: namely, 4 English, 2 French, 10 Germans, 1 Italian, 1 Hungarian; and amongst the number there are 2 ladies and 3 children.

The King presented me with 10,000 dollars for my expenses. I tried all in my power to be excused receiving this sum; but, as I was told that my refusal would greatly displease his Majesty, I deemed it prudent to accept his gift, which I have, of course, credited to her Majesty's Government. Furthermore, to show me respect, he issued orders that I should be treated generally with the same marks of honour that were accorded to himself; accordingly, on my arrival here, I was received by a procession of about 60 priests, who came to the beach of the lake to meet me, dressed in full canonicals, bearing in their hands all the symbols used in the Abyssinian Church, and chanting psalms and prayers for our welfare. His Majesty heard that on one occasion we were badly off for milk, and he immediately ordered 50 milch-cows to be placed at our disposal, and these animals have been here ever since. He has ordered a gold saddle, shield, bracelet, and dagger to be made for me; and the same, *minus* the saddle, for my companions Blanc and Prideaux.

I give you all these details to show you how well the Emperor has behaved towards me, and what an unexpectedly favourable turn the Abyssinian complication has taken. At one time we were afraid that Dr. Beke's mission would spoil the good understanding happily subsisting between us, but it does not appear to have had any evil effect. The Emperor sent me Dr. Beke's letter the other day, together with the petition from Cameron's family, with the remark that he had already released all the prisoners for the sake of our Queen.

He was anxious to see the released captives, in order that he might ask them in my presence whether he had not been justified by their conduct in his behaviour towards them. But I dreaded lest some cause of irritation might arise at this interview; so I begged him to dispense with their attendance, and suggested that, if he had any charges to prefer against them, he might send them to me to read to them. Accordingly, on the 15th he sent the document, with a request that I would read it to the prisoners in presence of all the other Europeans and a number of Abyssinian officers whom he appointed to attend. All the prisoners confessed that they had been to blame, and begged to be forgiven.

The Emperor has requested me to visit him once more, to have some talk with him; but I trust that he will soon give us leave to depart; but in any case we shall not get away before the Abyssinian Easter, which falls on the 8th proximo. I am not certain which route we shall take.

The reason the Emperor has sent us to stay at Korata—which is a large town, situated at the extreme south-east side of the lake—is because he thought we should enjoy the fishing and shooting for which it is celebrated; moreover, the shore is clean and rocky, while the opposite bank is muddy and covered with decaying vegetable matter. He himself is at Zagay, about five miles from where the river Abai leaves the lake. . . . Cameron sends his kind regards; he is improving in health daily. *

The PRESIDENT, in returning the thanks of the Society to Colonel Playfair, was almost disposed to add their thanks to the Emperor of Abyssinia for having treated the Queen's envoy so well. The result had been to modify the opinion he had held of the character of that monarch. He believed Colonel Playfair would explain to the meeting several circumstances connected with the expedition, which were noticed in the letter, particularly in reference to the two Englishmen, Plowden and Bell, who were formerly in the service of the Emperor of Abyssinia, and who had acted, indeed, as his advisers. It was on the loss of these gentlemen that he changed his conduct towards Europeans.

Dr. BEKE said he wished to speak with reference, more particularly, to the river Gāsh; but as his name had been mentioned in connection with the libera-

tion of the captives, he would merely say upon that subject, that the petition which he forwarded to the Emperor from the relatives of the captives deeply touched his Majesty's heart. He had no doubt that, had not the Emperor liberated the captives, as he is reported to have declared, for the sake of the Queen of England, he would have done so for the sake of their distressed relatives. The Gāsh was a remarkable river. The Greek geographer Artemidorus spoke of a "branch of the Astaboras" which divided into two; one part running into the *Atbara*, which was formerly regarded as the *Nile*, and the other into the Red Sea. It had long been a matter of speculation with him—and he regarded it as now proved—that the Gash was this river. It gave rise to an important geographical and political question, as to the power of the Ethiopians, or Abyssinians, to divert into the Red Sea the waters that supplied the Nile. The project had not only been entertained for many centuries, but the present Emperor Theodore had it in view, should he conquer that country, with the intention of destroying Egypt. Albuquerque proposed the same thing to Emanuel, King of Portugal, in the beginning of the sixteenth century. In 1842 a Turkish pasha endeavoured to turn the Gāsh into the *Atbara*. He built a dam, and nearly succeeded; but the dam was not strong enough. By a contrary process, the *Atbara* could be turned into the Gāsh. He mentioned this as a remarkable confirmation of the statement of Artemidorus made upwards of two thousand years ago. He agreed with Mr. Baker that it was that river which gave the fertilising soil to Egypt, and therefore, were it turned, Egypt would be ruined.

Colonel PLAYFAIR said it should be understood that the letter which Mr. Rassam sent to him was a private communication. He had not the slightest suspicion that any part of it would be made public. It was so mixed up with private matters that he had to erase a great number of sentences. Therefore, if the communication appeared fragmentary, they must lay the blame on him, and not on Mr. Rassam, for the letter in its original state was exceedingly well written. In the letter he mentioned that the Emperor of Abyssinia said all the Englishmen had been insane that he had seen since the death of Plowden and Bell. It might be known to most people that Mr. Plowden was her Majesty's consul in Abyssinia. He resided in that country for many years, and took rather a prominent part in the politics of the country; in fact he was almost King Theodore's minister. Mr. Bell was in reality the king's minister. He was his robe-wearer, a sort of *alter ego*. It was his duty to go into battle dressed in the robes that the king usually wore, and thereby divert to himself the danger which otherwise would have attended the king's position in battle. He thought from Mr. Rassam's letter that two things were manifest: first, that Mr. Rassam had executed the very difficult mission entrusted to him with singular tact and judgment; and secondly, that King Theodore, like another person to whom he had been compared, was not quite so black as he was painted.

The PRESIDENT, in closing the meeting, said it only remained for him to congratulate the Society upon the termination of a session productive of most remarkable results. The *finale* of it had been quite as successful as the commencement; for they had commenced and finished with the discoveries of their distinguished Associate, Mr. Baker. He now adjourned the meeting to the 12th of November, when he hoped to see the room as full as it was on the present occasion. He trusted the motto of the Society would continue to be, "Forward, ever forward."

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *Letters from M. de Khanikof on the Subject of Sir H. Rawlinson's Criticisms of the MS. Travels of the anonymous German Traveller in Central Asia; with Remarks on the Letters, by Viscount Strangford.*

M. DE KHANIKOF has recently addressed the following letters to Sir Roderick Murchison, President of the Society, reviewing the objections of Sir Henry Rawlinson to the authenticity of the travels in Central Asia of Georg Ludwig von ———.*

"SIR RODERICK,

"10 Avril, 1866. Paris, 35 et 37 rue de Seine.

"J'ai eu l'honneur de recevoir votre lettre du 7 Avril courant, et je m'empresse de vous adresser l'expression de mes remerciements pour l'aimable attention que vous avez eue de me communiquer quelques détails sur l'intéressante discussion qui a eu lieu le 26 Mars, à la Société de Géographie, touchant le voyage problématique de l'Allemand Georg Ludwig von ———.

"J'ai lu l'article inséré dans le *Times* du 28 Mars, et certes j'avais l'intention de vous écrire à ce sujet; mais j'attendais, pour le faire, la réception du *Ship of Meeting*. Cependant, après avoir reçu votre obligeante communication, je me décide à vous transmettre mes observations sans plus tarder.

"Sir H. Rawlinson a raison d'accepter avec défiance le récit d'un voyage par un individu, par celui de l'Allemand en question; mais je crois que pour le juger, il faut en élaborate *hoax*," il faudrait avoir sous les yeux la série complète des documents qu'on se propose de critiquer.

"Or, jusqu'à présent ce voyage n'a été connu que par un extrait, très imparfait, de son commencement, donné par Mr. Vénikof, dans les Mémoires de la Société de Géographie de St. Pétersbourg, et par quelques détails que j'ai eu l'honneur de vous transmettre moi-même il y a environ deux ans et demi. Dans ces deux analyses la partie la plus importante des documents en question, le levé topographique qui y est annexé, ne pouvait être mentionné que très brièvement. Il se trouve ainsi que précisément ce levé, qui constitue le titre principal de la question en litige, ne pouvait pas être examiné par les savants qui ont cru pouvoir juger cette affaire en Angleterre.

"Le Général Rawlinson relève très judicieusement quelques observations peu admissibles du voyageur Allemand; elles m'ont frappé aussi, sans que je crusse avoir toutefois le droit de rejeter, par cette seule raison, l'ensemble des résultats obtenus par mon anonyme; car j'insiste sur le fait que le levé est le seul document exécuté pendant le voyage, tandis que le mémoire qui l'accompagne est évidemment une relation peu détaillée et développée, sans aucun doute, après coup. Le style même de cette relation prouve que l'auteur était très loin d'être un homme lettré; il s'exprime comme l'aurait pu faire un petit employé Allemand de l'administration du cadastre, plus familier aux procédés des travaux matériels de topographie qu'à des recherches purement scientifiques. Néanmoins, examinons les objections que Sir H. Rawlinson a cru devoir faire pour combattre l'authenticité du récit de notre voyageur.

* See the present volume of the Proceedings, p. 134 et seq.

“La première consiste en ce que le nom de son compagnon, le Lieut. Harvey, n’a pu être retrouvé dans les annuaires des officiers attachés au service de la Compagnie des Indes au commencement de ce siècle; et cette objection serait très sérieuse si l’époque du voyage de Georg Ludwig von ——— était rigoureusement déterminé. J’observerai à ce propos que d’après les renseignements que j’ai obtenus dans l’*East India House*, par l’entremise d’un ami, et grâce à l’obligeance de Mr. Fitzgerald Hall, je suis parvenu aux conclusions que voici : Ce n’est que depuis 1800 que l’Administration des Indes a commencé à imprimer la liste de ses employés; que dans les trois premiers annuaires le nom du Lieutenant Harvey ne se trouve pas; mais que dans l’annuaire de 1801, parmi les Européens établi dans l’Inde, il y a trois Harvey—un musicien, un marchand, et un esquire, et que ce dernier pourrait être à la rigueur le Lieutenant retrahi en question. Mais sans attacher plus d’importance à ce fait qu’il le mérite, je remarquerai que Sir Henry se trompe beaucoup s’il croit devoir placer ce voyage dans le commencement de ce siècle, parceque le mémoire qui accompagne les plans a été fait en 1805. J’ai tout lieu de croire que ce voyage a été entrepris dans les 20 au 30 dernières années du siècle dernier. Mes raisons se basent sur deux passages de cette relation,—1, la mention que Badakhchan était encore au pouvoir des Chinois; et 2, que la défaite des nomades établis au nord de Badakhchan par les troupes Chinoises, événement que l’auteur Allemand décrit avec beaucoup de détails, a eu lieu dix ans environ avant son passage dans ces contrées. Autant que je sache, la dernière fois que les Chinois ont mentionné Badakhchan parmi les provinces tributaires du Céleste Empire a été l’an 1790; et la défaite que je viens de mentionner a eu lieu le 23 Novembre, 1759. Ainsi il n’est pas étonnant qu’en 1805 ou 1806, le savant Mr. Crawford a pu n’avoir rien entendu raconter sur une tentative avortée depuis 25 ans d’acheter des chevaux dans l’Asie Centrale, et que le Lieutenant Harvey pourrait depuis longtemps être mort, ou avoir quitté l’Inde. La seconde objection du Général porte sur ce fait, qu’il lui paraît impossible d’aller du Kachemir à Kachghar en 25 jours. Mais le savant Général a certainement oublié, en attaquant la possibilité de ce fait, que Chah Souleiman, expulsé par Mir Weis de Kachemir, a parcouru, avec une suite nombreuse, en onze jours, la distance entre Séringour et Badakhchan, égale à celle qui sépare Séringour de Kachghar. (*Voy. Ritter, ‘Erdkunde,’ t. vii., p. 798, et Petermann, Chart of the World, 1863.*)

“De même, le Général trouve peu remarquables les données statistiques fournies par le voyageur Allemand sur la Kachemir. Il attaque surtout le chiffre de 525 Arméniens qui y avaient leur résidence, et y possédaient une belle église en pierres, bâtie en 1615, parcequ’un voyageur Russe contemporain ne parle pas d’Arméniens établis dans cette ville. Cette objection me paraît un peu hasardée; car entre l’époque des deux voyages Kachghar a été bouleversé par beaucoup de révolutions, et surtout par le soulèvement de Khodja Djilhounguir en 1826, personnage connu par son fanatisme Musulman, et qui aurait suffi à lui seul pour chasser ou anéantir une population Chrétienne trois fois plus considérable. Les exemples de faits semblables ne manquent pas dans l’histoire de l’Asie. Ainsi Marco Polo fait mention d’une église Chrétienne à Samarcande, et Ibn Batoutah, venu dans cette ville 80 ou 60 ans après le voyageur Vénitien, n’en dit rien. MM. Forster et Christie ont trouvé des Arméniens à Hérat; et ni Conolly, ni Ferrier, ni moi, ni Vámbéry n’en avons plus rencontrés. Il ne s’en suivrait pas que l’une des relations soit entachée d’inexactitude.

“Les reproches adressés par Sir H. Rawlinson à notre voyageur sur ses inexactitudes zoologiques, tels que la mention de lapins noirs et l’omission des yaks sur le Pamir, de même que son observation plus que douteuse de la présence d’un volcan en activité au Kachemir, me paraissent assez fondées; mais ne donnent certes aucun droit de nier pour cela seul l’authenticité du voyage.

Marco Polo a pu se tromper sur la nature et les dimensions de l'oiseau gigantesque qu'il nomme *Ruc*, mais néanmoins il a bien visité les pays qu'il décrit.

“D'un autre côté, si, comme j'ai eu l'honneur de vous le dire dans ma lettre, nous prenons en considération que toute la partie du levé, déposé aux archives de Pétersbourg en 1805, se trouve partout, où il a été possible de le contrôler par des travaux modernes, être aussi exact que le comportaient les méthodes topographiques en usage au commencement de ce siècle ou à la fin du siècle dernier, il est absolument impossible de se refuser à admettre l'existence réelle d'un observateur, en chair et en os, et dont on ne saurait nier la présence dans les contrées qu'il dit avoir visitées. Je demande à tout homme impartial, comment pouvait-on tracer en 1805, ou même avant, les environs de Samarcande sans y avoir été, et les tracer presque aussi exactement que nous l'avons fait en 1841? Comment pouvait-on poursuivre le cours du Syr-dariah en amont et en aval de Tachkend, en indiquant les noms exacts du karavanseraïls construits sur cette route sans l'avoir parcouru, et noter en même temps tous les affluents du bord droit du Jaxartes, sans les avoir franchis? Comment se trouve-t-il enfin qu'en 1805 un homme qui, je le répète, est bien loin d'être un savant, ait pu tracer avec des détails surprenants la carte des environs de Kachghar, presque identique à celle que Klaproth a publié vingt-et-un ans après, en 1826, d'après les sources Chinoises? J'aurais pu multiplier ces questions à volonté, mais j'espère, Monsieur, que ce que je viens de dire est suffisant pour vous convaincre que les géographes Russes en général, et votre très humble serviteur en particulier, n'ont pas été crédules outre mesure en admettant comme authentique le récit d'un voyageur relativement sérieux, et auquel, malgré mon bon vouloir d'accepter l'opinion des membres éminents de la Société de Géographie de Londres, je ne saurais comparer à Robinson Crusoe.

“Il y a enfin une raison morale qui m'empêche à croire que l'Allemand en question soit un vulgaire imposteur. Il est venu à Pétersbourg bientôt après que la folle entreprise inspirée par Bonaparte, Premier Consul, à l'Empereur Paul I., de lancer les Cosaques du Don sur l'Inde, a été arrêtée par le mort de ce souverain. Il serait donc plus naturel de croire qu'un homme qui tiendrait à vendre le plus cher possible ses communications les arrangeât de manière à flatter la marotte de quelques membres puissants du gouvernement Russe, doués d'une imagination facile à enflammer, et présente l'expédition dans l'Inde comme faisable. Bien loin de là, il insiste sur les difficultés immenses qu'il a rencontrées avec la petite troupe d'hommes qui l'accompagnait; et certes, si un document géographique est capable de décourager un gouvernement de se lancer dans une pareille entreprise, c'est bien la relation du mystérieux Georg Ludwig von —.

“En résumé, je crois que—

- “1. Le voyage a été entrepris et exécuté dans les vingt dernières années du XVIII^{ème} siècle.
- “2. Que le levé recopié et remis à net à Pétersbourg en 1805 a été fait pendant le voyage. Que ce levé présente toutes les garanties d'exactitude, surtout dans les régions où le voyageur n'était plus sous l'influence de la terreur que lui inspiraient les Afghans. Et,
- “3. Que la description de son itinéraire, rédigée plusieurs années après le voyage, est faite à la hâte, et présente des inexactitudes et des omissions très explicables.

“Agréez, Sir Roderick, l'assurance de la haute considération avec laquelle j'ai l'honneur d'être

“Votre très humble et très obéissant serviteur,

“N. DE KHANKOF.”

“SIR RODERICK,

“10 Juin, 1866. Paris, 35 et 37 rue de Seine.

“Lorsque j'ai eu l'honneur de répondre à votre lettre du 7 Avril, au sujet du voyageur Allemand, si vivement attaqué par Sir H. Rawlinson dans la séance

de la Société de Géographie du 23 Mars, je n'avais sous les yeux ni le texte des observations faites à cette occasion par le savant Général, ni même l'ensemble de la relation du voyageur en question. Aussi me suis-je borné à relever quelques faits isolés, qui me paraissaient militer en faveur de l'authenticité de cette exploration énigmatique de l'Asie Centrale.

"Depuis lors je suis allé à Pétersbourg, d'où j'ai rapporté l'original de cette relation, déposé en 1806, le 14 Août, dans les archives du Dépôt de la Guerre, avec les cartes qui accompagnent ce travail, et j'ai trouvé à mon retour ici le *Slip of Meeting* de la séance du 23 Mars; de manière qu'actuellement je suis en mesure de parler de la question avec une entière connaissance de cause.

"Je crains que ma lettre ne vous paraisse intempestive; mais toutefois j'espère que l'intérêt que vous portez aux questions géographiques vous disposera à l'accueillir avec votre indulgence habituelle.

"Avant d'entrer dans le vif de la question, permettez-moi de vous faire observer qu'en général l'authenticité du récit d'un voyageur peut, selon mon appréciation, être attaquée de trois façons différentes: 1. En prouvant par une comparaison rigoureuse des détails qu'il donne dans son voyage avec des faits réels, que les premiers sont fictifs. 2. En établissant que l'auteur a habilement profité des travaux d'autres explorateurs, et qu'en groupant ses emprunts avec un certain artifice il a cru pouvoir faire croire qu'il a visité lui-même les régions qu'il décrit; et enfin, 3. En prouvant que le voyageur, sans avoir parcouru l'ensemble des pays qu'il décrit, soit disant *de visu*, a été dans certaines parties de cette région, et a habilement remplacé les observations personnelles par des oui-dire recueillis dans le voisinage. Aucune de ces trois objections n'est applicable rigoureusement à l'auteur en question. L'exactitude de certains détails topographiques que nous pouvons contrôler, et dont Sir Henry lui-même dit que: 'The ascent of the Yaman-yar River, from Kashgar to the Lake of Kara-Kul (the "Dragon Lake" of the Chinese), seemed to be genuine; ' et la détermination assez rigoureuse de positions astronomiques ne permettent pas de placer le voyage dans la première catégorie.* Supposer qu'on puisse en 1806, c'est-à-dire un an avant qu'Elphinstone ait entrepris son important voyage

par Georg Ludwig von —, serait admettre un fait très peu probable. On veut-on qu'il ait pu puiser des expressions du vocabulaire de la langue des Kalirs? Comment expliquer le tact philologique qui le guide pour arranger une série de noms de lieux tour-à-tour Indiens, Tibétains, Mongholes, et Turques, selon la nature des populations dont il parcourt les pays? En effet, si nous avions dans ce cas l'œuvre d'un imposteur érudit, et non les souvenirs naïfs et mal coördonnés d'un voyageur hardi, mais du reste homme très ordinaire, son nom ne serait pas une énigme pour nous, nous le reconnaitrions *ex ungue leonem*. Car à la fin du siècle dernier il n'y avait personne, pas même S. de Sacy et W. Jones, qui auraient été en état de faire ce tour de force d'érudition. Il ne faut pas oublier qu'à l'époque dont nous parlons, et pour étudier les pays qui nous occupent, on ne connaissait que la relation de Forster, celle du secrétaire de Nadir Chah, Mirza Abdoul Kerim, la Conquête du royaume des Eleuths dans les montagnes sur la Chine, la Vie de Tamerlan, traduite par Petit de la Croix, l'Histoire des Tatares d'Aboulghazi Khan, et quelques traités de géographie orientales; et je défie l'homme le plus habile de composer à l'aide de ces ouvrages une relation

* "Sir Henry se trompe quand il dit:—'It was to be observed, too, that he (the German traveller) never alluded in a single passage to his being provided with a sextant, or a quadrant, or a chronometer, or with any instrument whatever necessary for these determinations.' Nous lisons dans le rapport du voyageur Allemand: '*Glücklicher Weise hatte ich den Ramapir, einen meiner Indianischen Dollmetscher, tagessvorher mit den mathematischen Instrumenten und arzeneien voraus geschickt*;' et il fait souvent mention de ses observations et de la perte de ses instruments.

pareille à celle du voyageur Allemand ; et je l'invite surtout à dresser les cartes qui accompagnent son mémoire. Nous voyons ainsi que la seconde catégorie n'est pas plus applicable que la première au cas que nous étudions. En ce qui concerne la troisième hypothèse, j'avoue qu'elle paraît être la plus probable. Mais si l'on met en doute la présence de notre voyageur dans l'Inde, comment expliquer sa résidence à Srinagur ou dans tout autre pays où il a pu recueillir des renseignements assez détaillés sur les pays limitrophes ? D'un autre côté, il faudrait admettre aussi qu'il a eu l'occasion de résider dans la proximité des régions septentrionales de l'Asie Centrale, c'est-à-dire quelque part en Russie, car il donne des détails assez circonstanciés sur différentes parties de la steppe des Khirguises ; et dans ce cas comment supposer que le gouvernement Russe, en 1806, n'ait pas eu assez de confiance pour confier à un individu pour se mettre en garde contre ses inventions et ses assertions géographiques ?

"Toutes ces considérations n'ont certes pas échappés au savant Général, et il avoue lui-même d'avoir été tenté plusieurs fois d'admettre, 'after all, the Travels might be genuine.' Je regrette que Sir Henry n'ait pas succombé à cette tentation, car je dois avouer que les objections qu'il lui oppose me paraissent peu convaincantes, ce que je tâcherai de prouver en citant ses propres paroles, et en les comparant aux passages correspondants des auteurs dont il invoque le témoignage. Je ne reviendrai pas sur ce que j'ai déjà dit dans ma lettre précédente sur l'erreur principale de Sir Henry, quant à l'époque où il place le voyage qu'il critique ; mais j'observerai néanmoins qu'elle compromet, plus ou moins, toute la série d'arguments sur lesquels s'étayait sa critique.

"Sir Henry commence par citer une liste d'ouvrages très importants en effet pour l'étude des régions voisines de celles qu'a parcouru le voyageur Allemand ; et quoique toutes ces relations soient bien postérieures à l'exploration de Georg Ludwig von —, le Général a raison d'y chercher des points de comparaison avec les faits relatés par l'auteur qu'il attaque.

"J'observerai tout d'abord que quelques-unes des citations du texte de la relation du voyageur Allemand reproduites par Sir Henry ne sont pas exactes, mais je suis loin de lui en imputer la responsabilité, car il n'a pu puiser ces passages que dans ma lettre, ou dans le mémoire de M. Venjukof. Or, ni moi, ni M. Venjukof, je le crois, ne tenions pas, à l'époque où nous écrivions sur le voyage de Georg Ludwig von —, à citer sa prose avec une grande exactitude, car pour ma part je n'ai jamais eu l'idée qu'on puisse songer sérieusement à attaquer l'authenticité de son récit, et je me souviens de vous avoir écrit ma lettre de Pétersbourg, au courant de la plume, en ayant sous les yeux l'original Allemand dont j'ai extrait les détails que j'ai pris la liberté de vous communiquer. Pour obvier à cet inconvénient, je crois devoir vous transmettre cette fois une copie fidèle du texte Allemand de l'introduction, et des deux premiers chapitres de la relation de mon voyageur,* de même qu'une réduction exacte ($\frac{1}{2}$ de l'original) des deux premières cartes de son levé : je joins à ces documents une copie du même itinéraire en regard à la carte de Vigne : Map of Kashmir, with its passes, &c., by John Walker.

"Sir Henry commence par admettre que quoique personne jusqu'à ce jour n'ait visité le pays décrit par le voyageur Allemand, les recherches faites dans les pays limitrophes suffiraient pour permettre de dresser 'a thoroughly trustworthy map of the countries between the Russian frontier and the Indus.' Tout en reconnaissant comme lui l'immense service rendu par des explorateurs comme Moorcroft, Trebeck, Jacquemont, Wood, &c., pour élucider cette partie obscure de la géographie Asiatique, je me permettrai d'opposer à l'opinion du savant Général celle de Strachey, qui dans son excellent mémoire, 'On the Physical Geography of Western Tibet' (p. 5, Transactions R. G. S., t. xxiii.) s'exprime à ce sujet ainsi : 'The countries occupying the main mountain mass

* See p. 310.

between Pamir and the north-west extremity of Maryul (Kafiristan, Chitral, Yassen, &c.), have been so COMPLETELY barred . . . search by the barbarism of their inhabitants, that their names even are uncertain, and we know scarce anything of their geography beyond the fact of their being highly mountainous.' Mr. Strachey a contribué plus que ses devanciers à rectifier nos notions sur la région de l'Himalaya; mais néanmoins, les pays visités par l'Allemand inconnu restent jusqu'à présent un pays où il n'a pas eu de prédécesseurs. Plus loin Sir Henry entre dans un examen détaillé des faits relatés par Georg Ludwig, et il lui fait dire, 'I passed on the 9th of May in sight of a volcano, Darmundand, which is always smoking and throwing up stones, but rarely emits flames.' Cette citation n'est pas exacte, car voici ce que porte le texte de notre voyageur: 'De là (de la montagne Astinagur) on doit apercevoir vers le sud-est le volcan *Darmundand*, qui est presque toujours en activité, fumant et lançant des pierres; mais il vomit rarement des flammes.' Le *Ship of Meeting* fait suivre ce passage de l'observation suivante: 'Now he (Sir Henry) would ask our Kashmir travellers, and he saw many of them present at the meeting, if there was any such thing in the whole valley as an active volcano. The notice of a volcano within a day's march of Srinagur was a direct proof of mendacity.' Je dois avouer que ce passage m'inspirait aussi de doutes avant que j'ai étudié cette question de plus près; mais je demandai à Sir Henry qu'est-ce qu'il aurait répondu, si quelqu'un des géographes présent au meeting lui aurait observé que précisément à un jour de distance de Srinagur il y a une élévation dont Moorcroft rapporte ce qui suit (t. ii., p. 277): 'As it was commonly asserted that loud explosions were frequently heard from the hill on which stood the Ziarat of Shukar-ad-dirs, we determined to land and visit it.' Et plus loin, page 279: 'There was nothing in the hill that looked like a crater; but the people on the spot asserted their recollection of sudden explosions, in one of which, not very long ago, the door of the Ziarat and one of the windows were torn off. The noise was sudden, but as loud as the report of a cannon, and alarmed the whole neighbourhood. According to the superstitious notion of the Kashmirians, these noises precede and announce some political change.' Aurait-il taxé Moorcroft aussi de rapporter des mensonges; d'autant plus si on lui avait montré, en sus, sur la carte de James Wyld, Map of Afghanistan, Cabul, the Pendjab, Radgootana, and the river Indus, le nom de Darmundand à 34° lat. et 75° 30' de long. à l'est de Greenwich, précisément au sud-est de l'endroit désigné par l'Allemand? Ainsi je ne dis pas que le fait avancé par Georg Ludwig soit vrai; mais il ne fallait pas le rejeter en prétextant que personne n'a rien vu ni entendu de semblable.

"Plus loin Sir Henry dit: 'Then again, he (the German traveller) speaks of the Indus as the "Sindu," while in reality there is no such specific name as the Sindu known in that country.' Cela peut être exact, mais même des cartes modernes, comme celle, par exemple, qui accompagne les œuvres posthumes de Victor Jacquemont, portent Indus ou Sind. Après avoir reconnu que '*Imbra* being the real Kafir name of God,' le Général ajoute: 'The only misfortune is that there are no Kaffirs within 200 miles of the frontier of Kashmir.' Si le savant Général ne s'était pas trompé dès le commencement sur l'époque du voyage de Georg Ludwig, il n'aurait pas fait cette observation, qui n'est pas exacte, car il se serait souvenu d'une note de Wilson, dont il dit lui-même, 'than whom there never lived a more accurate or laborious critic.' Cette note se rapporte à un passage du voyage Moorcroft, t. ii., p. 266: 'Proceeding to the westward, we come to the district of Gilgit (précisément celui dont parle Georg Ludwig), inhabited by Dardus.' A cela Wilson remarque: 'Few people can be traced through so long a period in the same place as these, as they are evidently the *Daradas* of Sanskrit geography, and *Daradæ* or *Daradææ* of Strabo. They are also, no doubt, the Kaffirs of the Mahomedans, although they have OF LATE been NOMINALLY converted to Islam.'

"J'ajouterai à cela, qu'avec un petit effort de cette perspicacité merveilleuse qui a guidée Sir Henry dans ses beaux travaux sur les cunéiformes, il aurait reconnu dans les Dehachgour-Gobi les Daradræ de Strabon. Cette même note de Wilson répond à une autre objection de Sir Henry, qu'il formule un peu plus loin de la manière suivante : 'It is remarkable, indeed, that from the time he (the German traveller) leaves the Indus he never sees any Mahomedans—the natives are all heathens; whereas in reality, with the exception of the small community of Kaffirs north of the Cabul river, all the inhabitants, from the Indus to the Oxus, are Mussulmans.' Immédiatement après Sir Henry cite une description de Georg Ludwig des bords de l'Indus qu'il termine par l'observation, 'compare with this sylvan scene Vigne's description of the bed of the Indus at Acho.' Je vais profiter de ce conseil, et transcrire le passage cité de la relation du voyageur Allemand et celui de M. Vigne, mais je remarquerai d'abord que Sir H. Rawlinson n'aurait pas parlé de ce dernier s'il avait fait attention que sur la carte même de Vigne, à droite de l'embouchure de Gilguit, qui est probablement le Laimaki de Georg Ludwig, on lit en toutes lettres *Fir forest*. Maintenant, voilà le passage critiqué, que je traduis d'après l'original :—"Au sortir de la vallée de *Pantcha-Buli*, que nous quittons à l'aube du jour, en nous dirigeant vers le Sind, une vue d'une beauté inexprimable frappa nos yeux. Nous vîmes devant nous illuminés des rayons du soleil levant cinq cimes élevées des glaciers de *Soltshar*, d'*Olatama*, d'*Imra-Emba* (le Siège de Dieu), *Ardu* et *Dimrita*. Mais au-
à notre gauche le *Bastam-Bolo*. Un
jusqu'au milieu de sa cime neigeuse tandis que les autres se montraient dans toute leur splendeur. Sous nos pieds se déroulaient les longues vallées des fleuves *Sind* et *Luimaki*, et leurs belles prairies ressemblaient à des tapis verts. Sur la pente du bord élevé et méridional du Sind nous vîmes les villages *Paribuwa*, *Sarlumba*, *Tarilumba*, et *Birlumba*. Les collines moins élevées étaient couvertes de sapins, de cedres, et d'autres beaux arbres, et elles rendaient encore plus pittoresques les plans éloignés des vallées. Le Sind, large ici de 80 faden, souvent entravé dans son cours par des rochers élevés, roulait ses ondes bleues avec un bruit majestueux. Les glaciers resplendissaient des couleurs les plus variées. Leurs crévasses paraissaient tantôt illuminés de lumière rose, tantôt de lumière verte."

"M. Vigne parvint à l'Indus près d'Acho, en suivant la vallée étroite de l'impétueux Husára, et voilà ce qu'il dit de la végétation de cet affluent du bord gauche de l'Indus (p. 301, t. ii.) :—"On the banks of the river were firs, jelgoza (a pine whose seeds are edible), pines, junipers, walnut-trees, wild peaches, apricots, almonds, mulberries, barberries, gooseberry, currant, and rose bushes; and I ate some excellent black grapes, brought to me from a place in the neighbourhood, where there had once been a village.' En voilà j'espère assez pour contenter l'amateur le plus exigeant des 'sylvan scenes.' Passons maintenant à sa description de l'Indus près d'Acho (*ib.* pp. 302, 303, et 304) :—"Sentries were posted on the principal mountain-tops during the night around our encamping-ground, beneath the point of Acho, to which we ascended on the next morning."

"Of all the thousand and one prospects which every turn or rise in the paths of Tibet presented to my sight, few could boast of more interest and magnificence than that from Acho. It was magnificent from its EXTENT and SUBLIMITY, and most interesting because no European probably had ever seen it before."

"The mountain on which we rested was the last peak of the ridge that rose on the left bank of the Husára stream, and immediately above its junction with the Indus. Its elevation by thermometer was about nine thousand feet above it. On the right, about eighteen miles distant, was Makpon-i-Shagrán."

“This point forms the great portal by which the noblest river of Hindustan emerges from the thralldom that governs its course through the Cordilleras of the Himalaya. The mountains forming the defile through which it flows seemed to abut suddenly, and at right angles to it, upon the plain of Bong; and, from the place of its debouchure on the north, *I fancied that I could follow with my eye the direction of its course southward, to the place of its final exit, and the commencement of its wanderings over the plains of the Panjab.*

“Bong is a flat and open space on the left bank of the Indus (*vide map*), extending from the opposite side of the Husára river to the Makpen-i-Shagan gates, and partially cultivated, but more usually sandy and barren, and it occupies the corner between the latter place and the junction of the Husára river. Achmet Ali informed me that he had offered to come and colonise it from Little Tibet, but that his father did not seem to relish the proposal, probably from fear of his making himself independent.

“On the opposite bank I saw the opening of the valley of Gilghit, whose river empties itself into the Indus. I took bearings of many of the countries beyond it, from the information of the experienced mountaineers around me; and in this way I obtained a good idea of the relative positions of Yessen and Chitral, whose mountains were pointed out to me.

“The Indus, a large and raging torrent, was at my feet, and the roar of its waters was distinctly audible amidst the silence that pervaded all within our ken. They pursued a straight direction, and were visible for at least forty miles; the enormous slopes that bounded their course preserving a respectful distance, and receding from them so as to form a vast, open, and regular valley of not less than six or seven miles. Two others met at the end of that distance; that on the left bank was pointed out to me as Bonyr (of which point, however, I am not sure); whilst the river appeared to turn a little more westerly, by following that on the right; but its course, as I have remarked, was still traceable by means of the mountain-tops.”

“Tel est le passage du voyage de Vigne que Sir H. Rawlinson oppose à la description des mêmes localités faite par le voyageur Allemand, et j'avoue qu'il m'est impossible de comprendre comment Sir Henry a pu conclure des détails clairs et précis fournis par Vigne, que: ‘In reality the Indus in this part of its course flows through narrow and precipitous gorges, where there is hardly footing for a mountain-goat, and can only be crossed by rope-bridges.’”

En comparant le levé du voyageur Allemand avec la carte de M. Vigne, on verra que ces deux documents reproduisent presque identiquement le caractère général du terrain. Ainsi, la vallée étroite qui conduit au bord gauche de l'Indus, un peu plus étroite chez le voyageur Allemand que chez Vigne, a la même direction dans les deux levés. La carte Allemande n'indique pas la rivière de Husára, mais comme d'après elle la vallée débouche en face de l'embouchure de Luimaki, tandis que la vallée suivie par Mr. Vigne le conduit à l'Indus un peu à l'ouest de l'embouchure de la rivière Gilghit, on peut croire que Georg Ludwig a suivie une vallée voisine à celle de la rivière Husára, mais placée plus à l'est. La position du Mont Diarmul de la carte de Vigne correspond à celle que le voyageur Allemand donne au Mont Bastam-bolo. Voici, du reste, comment le voyageur Anglais décrit cette montagne (t. ii., p. 204):— ‘I quickly followed him, and the stupendous peak of Diarmul, or Nanga Purbut, more than forty miles distant, in a straight line, but appearing to be much nearer, burst upon my sight, rising far above every other around it, and entirely cased in snow, excepting where its scarps were too precipitous for it to

* “Si Sir Henry avait examiné la carte de Vigne il aurait vu que précisément dans l'endroit où il croit qu'à peine un bouquetin peut placer son sabot M. Vigne indique une *horse road to Silitu*.”

remain upon them. It was partially encircled by a broad belt of cloud, and its finely pointed summit glistening in the full blaze of the morning sun, relieved by the clear blue sky beyond it, presented, on account of its isolated situation, an appearance of extreme altitude, equalled by few of the Himalaya range, though their actual height be greater.

“This peak is called Diarmul by Tibetis, and Nanga Purbut, or the Naked Mountain, by the Kashmirians. I should estimate its elevation at 18,000 or 19,000 feet above the level of the sea, and the ridge from which the highest point rears itself is seven miles long, by a rough survey which I was afterwards enabled to make. It stands on the western bank of the Astor river, in the angle formed by its junction with the Indus, and has no mountain of equal height between it and the plains.” Ce dernier point constitue une différence importante avec le levé du voyageur Allemand, qui place le Bastam-bolo sur la rive droite de l’Indus ; je ne doute pas que Vigne soit plus correct que son prédécesseur, mais cette différence est facile à expliquer ; et tout homme qui a fait des levés dans un pays montagneux la comprendra. La position d’une montagne s’obtient par l’intersection des directions prises de différents côtés, le tracé du cours d’une rivière doit être fait dans sa vallée même, et si on la perd de vue on ne peut jamais être sûr de la direction qu’elle prend par rapport aux montagnes qui la cachent. Du reste, comme je l’ai dit dans ma lettre précédente, je crois que la terreur qu’inspirait les Afghans au voyageur Allemand, les trois premiers jours de son voyage, a fait qu’il y avait beaucoup de lacunes dans le commencement de son levé, et qu’il a eu tort de ne pas les indiquer franchement, au lieu de les remplir après coup, d’après ses souvenirs. Avant de suivre notre voyageur et son savant critique au delà de l’Indus, je dois répondre encore à une objection soulevée par Sir H. Rawlinson, qu’il formule ainsi :—“He (the German traveller) leaves Srinagar, he it observed, on the 8th, and he crosses the Indus on the 10th. Now, the direct distance from the town of Srinagar to the nearest point of the Indus cannot be under 120 miles . . . and he (Sir Henry) believed the Indus could not be reached from Srinagar at any point under fifteen days; yet this writer pretends that he crossed the river on the second day.” J’observerai en premier lieu qu’un homme qui dit qu’il part de Srinagar le 8, et qu’il traverse l’Indus le 10, ne peut pas prétendre à l’avoir passé, le *second*, mais bien le *troisième* jour de son voyage, et en effet le voyageur Allemand dit explicitement que malgré son désir d’atteindre l’Indus le soir du second jour, il en a été empêché, et ne peut y parvenir et passer la rivière que le 10. Or si j’admette que le calcul de la distance entre Srinagar et l’Indus établi par le Général soit exact, et il est même conforme au levé de Georg Ludwig, qu’est-ce qu’il y a d’extraordinaire de faire par jour en moyenne 40 miles Anglaises, ou 64 kilomètres ? Je suis sûr que Sir Henry l’a fait souvent, comme moi, et comme toute autre voyageur. Il a eu tort de citer l’exemple de Mr. Godwin-Austen, qui a mis 20 jours pour aller de Srinagar à Iskardo, car cette dernière route présente infiniment plus de difficultés que celle que décrit le voyageur Allemand, Vigne, Moorcroft, &c., et puis la distance entre Srinagar et Iskardo est plus longue que celle entre Srinagar et l’embouchure de la rivière Gilgit.

“Ma lettre est devenue si longue qu’il m’est impossible pour le reste d’entrer dans beaucoup de détails, aussi me bornerai-je à relever encore trois points de la critique de Sir Henry Rawlinson. Il dit : ‘The “Bili” language is here first brought to our notice, but none of our philologists or geographers know of such a language.’ Le savant Général a parfaitement raison ; mais il est évident que le voyageur Allemand voulait parler de *Balti*, ou le langue du *Baltistan*, dont son oreille Allemand a fait Bili. Plus loin, Sir Henry critique les détails donnés par Georg Ludwig sur l’inscription qu’il a rencontrée sur sa route dans la vallée de Luimaki, et il observe :—‘There is no alphabet in the East which runs in a vertical direction except the Chinese, and to find a Chinese inscription

on the Peshawer frontier may be put down as a moral impossibility.' Je considère ce passage comme un simple *lapsus lingue* ou *calami* de Sir Henry, car il est impossible qu'il ne sache pas que le Japonais, le Mandchou, le Monghol, l'ancien Ouïgour, et l'ancien Syriaque s'écrivent ou s'écrivaient de haut en bas, et qu'il n'y a rien d'absurde de trouver une inscription *Monghole* sur la frontière septentrionale de l'Inde, car nous savons combien les Mongholes, successeurs de Tchinguiz, ont fait d'incursions dans ces pays pour y établir leur domination.

"Je termine mes observations par quelques remarques sur le sacrifice du lapin noir, rapporté par le voyageur Allemand. Je crois, comme Sir Henry, qu'un 'rabbit—and especially a black rabbit—was an animal entirely unknown in the East, and could not possibly have been met with in the highlands of the Indian Caucasus'; mais aussi il est très évident qu'il s'agit ici de la marmotte à large queue du Tibet, de l'*Arctomys caudatus* de Victor Jacquemont, et qu'il décrit en ces termes:—'Est-elle un peu plus grande que la marmotte des Alpes, la queue longue comme deux-tiers du corps. Le ventre et les pattes fauves, le dos noirâtre. La queue tout-à-fait noire. Le museau et le tour des yeux noirs.' Ainsi l'animal en question n'est pas de couleur noire; mais il est si facile d'oublier que le voyageur Allemand rapporte qu'on a coupé la peau de ce lapin en autant de morceaux qu'il y avait d'étrangers, et que chacun d'eux a reçu une parcelle de cette peau en souvenir de la cérémonie. Or, comme notre voyageur a écrit sa relation plusieurs années après la perte de son journal de voyage, il n'est pas étonnant qu'il ait pu conserver l'impression de la couleur du morceau de peau qui lui était échu en partage, et qui pouvait être noire. Mais qu'il en soit ainsi ou autrement, il est très naturel qu'un homme peu versé en zoologie ait pu prendre une marmotte pour un lapin, et qu'il a mis dans son journal *Kaninchen* au lieu de *Murmelthier*.

"Je vous serais très obligé, Sir Roderick, si vous jugiez convenable de porter cette lettre à la connaissance de la Société Géographique, devant laquelle j'ai été, très courtoisement, accusé de crédulité. Je serai très heureux si je parviens à ébranler vos doutes à l'égard du voyageur Allemand; mais je suis sûr, dans tous les cas, de ne pouvoir porter la cause que je défend devant un tribunal plus compétent que celui que vous présidez, et devant un juge plus impartial et plus savant que vous.

"Agrééz, Sir Roderick, l'assurance de la haute considération avec laquelle j'ai l'honneur d'être

"Votre très dévoué,

"N. DE KHANIKOF."

TEXT accompanying the Sections 1 and 2 of the Maps of Georg Ludwig von —, transmitted to the Royal Geographical Society by M. de Khanikof.

(Translated from the German by the Assistant-Secretary R. G. S.)

Itinerary from Sirinagur, through the land of the Belor by Kashgar, Bolor, Badakhshan, Chohan [Kokan?] and Toros [Talas?] in the land of the Kirghises, and from there back again by way of Otrar, Samarkand, Kashgar, and Yarkand.

Preface.

"The forty sheets of Maps, which are hereto appended, are the result of my surveys with the astrolabe; and I can vouch for their accuracy, especially as I have travelled over the same road, in part, twice, namely, in going and returning. As to the drawing of the maps, it has been done under my own eye, by my dear nephew Karl, my hand not being any longer fitted for such work. But the lettering has been put in by myself, in order to be sure of its

correctness. With the aid of the latitudes and longitudes (from the meridian of Greenwich) observed by me as far as Toros [Talas?], an expert cartographer might be able to compile, from my dead-reckoning, an exact map of these hitherto unknown countries.

“GEORG LUDWIG VON —

“14th August, 1806.”

First Map.

Early in the morning of the 8th of May, about six o'clock, I was making ready to leave Sirinagur with my Indians, by the Gate of Triumph, the most easterly gate of the city, when the Miri-Kafila or chief of the caravan with which I had intended to travel, denounced me to the Divan as a rich Armenian from Lucknow, who was intending to pass costly wares with the connivance of the tax officials, without paying duty. To my great annoyance I was arrested at the door by Afghan officers of the Guard, and thrown into the *Chalat* or fortress. Luckily I had sent forward the day before Ramapir, one of my Indian interpreters, with my mathematical instruments and stock of medicines, with orders to wait for me at Ushkur. In the meantime I was brought from the Chalat before the Divan, who examined my papers and acquitted me, on the strength of David Purup's letter of introduction to Sheikh Abdulla. As a precaution he ordered my baggage to be searched, and, as nothing suspicious was found there, I was set at liberty. I lost nothing through this business, except my time and a few rupees. Notwithstanding the indescribable heat, I started on my journey in the afternoon, through the northern gate of the fortress. In the whole of nature there is certainly no view more glorious than that which may be enjoyed looking northward from Sirinagur over Lake Dal and the vineyards surrounding it, which in the far distance is bounded by forests of plane-trees and Mount Astinagur. As far as Pirichosh,* a good parsang distant from the city, the traveller marches through continuous gardens. From that place to Ushkur, smiling fields, meadows, and woods succeed each other. At Ushkur I found my good Indian in a state of the greatest anxiety; but he had had the presence of mind, during his stay, to cultivate a good understanding with the Afghans, who keep guard beyond Ushkur. In order, however, to have nothing more to do with these people, we departed on the same evening for Marimati, where we pitched our tent on the side of the road. The Kashmirian villagers of Marimati here brought me excellent lake trout taken in a small tributary of the River Lahr, and a large fish out of Lake Pishur, through which the Lahr flows.

As far as Kamadin the traveller marches along the flat valley which stretches along the Umapati rivulet, bounded by the vine-hills. But just before arriving at Kamadin we ascended the slope of the mountain, on which we continued as far as a parsang beyond Zult. To the right of our road lay the broad valley of Umapati, which, on account of its picturesque situation and beauty, is called in Persian *Nuri tshenct*, that is to say, the “Light of Paradise.” The old Hakems of Kashmir had it closed beyond Zult with a wall which reaches to the Umapati, and is furnished with two redoubts. Both wall and towers now lie in ruins, but two 12-pounders could easily have put them into the same condition at the time of their erection.

At the point where the traveller from Zult descends from the mountain into the plain, two grave-stones lie close to the road, memorials of two Afghan chieftains of the Yusuishi clan who fell here under Ahmed Shah Durani. Beritanis, a small village not far from these monuments, as well as Dshandri and Mirigah, are famous for the excellent rice which is extensively cultivated in the marshy grounds bordering the Lake of Dshandri. These rice-fields extend to the other side of the Astinagur rivulet, on the left bank of which

* [Pir-i-Khush, “the good Saint.”]

there is a fallen monument with an old Indian inscription upon it, which my good Ramapir was unable to read. From Beritanis a footpath goes north-east to a Mohammedan chapel on Mount Astinaghur, which takes its name from Mulla Suleiman Kandahari, and is frequently visited by devout Kashmirians and Afghans. From there a glorious prospect must be obtainable over the whole of the beautiful valley of Kashmir, as that mountain, to all appearance, is 1500 feet higher than Lake Däll. From the eminence is also said to be visible, in the south-east, the volcano Darmudan which is almost always vomiting forth smoke and stones, but rarely breaks forth in flames. The rivulets Malungbur and Astinamra, which fall into the Dshandri Lake, flow from the plane-tree woods, forming the northern borders of the above-mentioned marshes.

Karmavadi, a village almost entirely destroyed by the Katter in the previous year, lies on the slope of the high mountains which bound the land of Kashmir. Here ceases the cultivation of the vine, although on the southern side of the mountains wild vines are found everywhere.

Second Map.

Half a parsang beyond Karmavadi lies the narrow pass which forms the sole outlet of the Kashmir valley towards the north-east. The entrance to it was formerly defended by a tower, which now lies in ruin; behind it the valley begins to widen. In the widened part lies the Kashmir village Logomong, with its meadows and pastures which afford excellent grazing-ground for the splendid herds of cattle in the place. Cattle form the chief nourishment of the inhabitants. Oxen graze in the lower grounds, goats on the heights. From the milk of both a peculiar sort of cheese is manufactured, which is well known in the neighbourhood under the name of "Logomongi," and which is even exported to India. This branch of trade and the fortunate freedom of these mountaineers from the grinding oppression of the Afghan soldiers, which distresses the inhabitants of Kashmir, have here favoured a state of prosperity with which is united a noble spirit of freedom and independence.

One parsang and a half from this village there was formerly, it appears, a wall closing in the valley, which here becomes broader; remains of it are still seen on the hills on both sides. Only five of the towers of the wall are now seen, and they are called in the language of the country *pantcha-bali*.* These quadrangular structures are of a very rude style of architecture. Each side measures 12 fathoms; the height, as near as can be judged, may be about 5 fathoms. If Kashmir were in the possession of a European power, the erection of two forts in this place, out of the reach of the heights, would enable a few companies to defend themselves easily against the attacks of the predatory Katter and Gobi, or even a large army. The mountains on either side are inaccessible, and the superior pasture would be of incalculable use to the cavalry which would be required as patrols to keep the inhabitants under control. I had a great desire to reach the Sind to-day; but I was obliged to give up the attempt, as my second interpreter, Tchandra-mali, in attempting to ascend one of the five towers, had so severely injured his foot by one of the stones falling on him, that he had several fainting fits and was brought to himself only with great difficulty. I had him wrapped up in warm coverings, and administered some medicine, by which means we were enabled to resume our journey on the following morning. But we were obliged to carry him on a stretcher for many days afterwards, to the great discontent of my sipahis.

Indescribably wonderful was the landscape which came into view, when we emerged from the valley of Pantcha-bali in early morning, and wended our

* [*Query*, Panch-bari, "the five towers."]

way to the Sind. Before us, in the crimson light of the sun, rose the five snowy peaks of Soltshar, Olatama, Imra-emba (the Throne of God), Ardud, and Dimirita; but, higher than all its brother mountains, rose up, on the left, the Bastam-Bolo, veiled with white clouds as far as the middle of its snowy cap; the others standing before us in all their undimmed splendour. The broad vales of the Sind and Luimaki rivers stretched forth to greet us, their glorious meadows spread out like green carpets. On the high slopes of the southern banks of the Sind were seen the villages of Paribawa, Sarlumba, Tarilumba, and Birlumba. The lower mountains overgrown with firs, cedars, and other superb trees, made the valleys look still more picturesque; and the Sind, here about a mile broad and often impeded with high rocks, rolled its blue waves with loud murmur. The icy caps of the mountains reflected various colours; in many places their clefts appeared of a rosy hue, in others sea-green. A powerful feeling of awe at these works of the Creator possessed our minds; and, as we gazed on the Eternal Almighty as Christ, my Indians bowed themselves to the earth, believing that they saw before them the beginning of their sacred mountain-chain *Himala*, the Seat of the Gods. But we were all scared out of these soul-elevating feelings, like so many godless beings, by the coarse and inhuman Afghan officers stationed at the frontier. Not only were my sound Indians searched in a most revolting way, flogged, and ill-treated; but the poor wounded interpreter was also torn down from his stretcher, and belaboured so that we all felt his life was in danger. The Afghans refused to pass us across the Sind, and, in order to get permission to go, we had to come to terms with the barbarians. They wanted 300 rupees; with much trouble I got the sum reduced to about 80 rupees, with which the scoundrels were at length satisfied.

The rafts on which the traveller is carried across the Sind are about two fathoms in length and breadth; and on each side are three or four inflated goatskins; a strong branch of a tree forms the rudder. We were lucky in our crossing, going in an oblique direction, at an angle of not more than 40°, the current being far weaker here than some few parsangs higher up. But it frequently happens even here, that the raft is carried down far below the mouth of the Luimaki, when the water is higher. In the middle of the Sind I found no bottom, with a sounding-line of 20 fathoms; and the depth was 7 fathoms a few fathoms distant from the right bank. In crossing the river we had got quit alike of the domain of Kashmir, the Afghan rule, and the Moslems. Near an old tower on the right shore we entered the territory of the Dshashgur-Gobi, a free and hospitable heathen people, with whom the Moslems are almost always at enmity.

The elders of the village Ghurbar, which lies at the foot of Mount Olatama, keep watch at the above-mentioned tower from sunrise to sunset; during the night no one would venture to cross the river. One of my Indians, whom I brought from Kashmir, understood their language, which is named the *Bili*, and by his means I was able to understand the Ghurbar elders. Three of them were clothed in black goatskins, underneath which they wore a short shirt and wide trousers narrower at the calves, and made of variegated cotton-cloth. Their weapons consisted of spears, and a very large bow and arrows. On their left side they wore a short and broad rapier, and on their right a dagger-shaped knife. Their head-covering consisted of a felt cap of irregular shape, with a narrow rim in front. The men had a strong smell of leather.

The first question they asked was whether we were *Mumdy*—that is, Mohammedans; and, when we answered them in the negative, they seemed much rejoiced. After some further conversation, we expressed our wish to continue our journey through the valley of the Luimaki; but they tried all ways to dissuade us from this, and begged us to stay a short time longer. In the meantime one of them was sent to Ghurbar, in order, as it appeared, to fetch

hither the headman. The two others pressed us meanwhile to enter the tower, where they had prepared a kind of dwelling, furnished with broad benches. They here gave us a dark red wine to drink, pouring it out of pitchers into silver bowls, and it was remarkably good. After this the person they had sent for arrived, in company with two other elders from the village, one of them better clothed than the other, and wearing his dagger suspended by a silver chain. This man repeated the question whether we were truly not Mohammedans, and said that we should be allowed to continue our journey unmolested, as soon as they had convinced themselves by ocular inspection of the truth of our statement. After long hesitation we were at last obliged to submit to them. The oldest of them examined us with the air of a connoisseur, his countenance wearing an expression of the utmost gravity, and having handled and fingered us rather indecently, he decided with evident satisfaction that we were no *Mumdy*. All five then, as if a signal had been given, leaped about in a wild manner, and cried out unceasingly, "*Imra Bolli, gish Bolli!*" After they had continued these mad cries for a quarter of an hour they filled their silver cups with wine, and joined with us in emptying them. In order to get away from them and be enabled to continue our journey unmolested through the Luimaki Valley, I gave them presents of 2 ells of red cloth and 5 rupees: upon which one of them offered to accompany us to Mestopan, the village which lies furthest up the valley. All these negotiations and examinations had consumed much time, and I considered it wisest to pass the night in the old tower.

We started in early morning on the following day, May 13th, and found, after travelling a few parsangs, a number of ruins on both sides of the road. We marched up the Luimaki and saw, about the middle of the valley, on the right hand, an upright stone tablet with an inscription in characters which had no resemblance to any kind of Indian writing; but it was much worn by the weather. As the lines of characters ran from top to bottom, I conclude that it was Chinese; but I may be mistaken, as I have no special knowledge of this language. Three parsangs beyond this inscription, I reached the village of Mestopan, where the elders of the village, as before, came to meet us; and, on being informed by our companion that we had been properly examined and found not to be *Mumdy*, seemed much pleased and received us hospitably into their village. This is the last village of the Dshashgur-Gobi, and hangs on a rock like a swallow's nest. The flat roof of one house, paved with flat stones, forms the court-yard of the next higher one.

In this style are built all the houses of the Gobi. I felt much the change from the pleasant climate of the lower part of the Luimaki Valley, to the raw and cold air of this place, which is affected by the proximity of the high snowy peaks. Nevertheless, the neighbouring meadows were beautiful, and crowded with herds of goats and sheep. The inhabitants weave of the fine goat's-hair a narrow cloth of dark brown colour, called *Dasunh*. They also occupy themselves in tanning the skins of sheep and goats, which they have the art of making similar to marocco-leather. The smell of this article is even more penetrating than that of russia-leather. The inhabitants carry with them a most powerful and penetrating odour, owing to the leather garments which they wear; for those who like it this was all very well, but to me it was very offensive.

Before the village stand, on a small hill, a number of poles with human faces, representing deceased inhabitants, coarsely engraved upon them. Rags of various sorts hung from the poles, and remains of food-offerings lay about. This sanctuary is called *Immer-Umma*. Our arrival in the village was celebrated by a new offering for the dead, in which a black rabbit and several large woodcocks were presented. At last, in testimony of their hospitality, the skin of the rabbit was cut into as many pieces as the number of my followers, and given to us when we started.

In Mestopan I was compelled to remain three days, because so much snow had fallen, on the night of my arrival, that the road between Mount Dimirita and Ardud was quite choked up. Messengers who were sent at length brought us the news that the road was again practicable. It took us, nevertheless, on the 17th May, from about six o'clock in the morning to about eight in the evening to accomplish the distance of 6 parsangs between this place and Ardud; this was owing chiefly to the circumstance that we had still to carry on a stretcher our Tchandra-mali, who had been beaten almost lame by the Afghans.

Ardud is the first village of the *Sardi-Gobi*, who inhabit the valley of the Tomi-tandura rivulet, where the *Zittir-Gobi*, a wandering tribe who live in tents of felt, also dwell.

Remarks on M. de Khanikof's Letters. By VISCOUNT STRANGFORD.

THE first of these letters, written before M. Khanikof had made himself acquainted with the German Baron's papers, consists merely of replies to a single weak point or two in Sir Henry Rawlinson's indictment, without any expression of opinion upon the truth or falsehood of their contents, viewed as a whole. From his second and more elaborate letter, however, it would appear that now, after having carefully consulted all the Baron's memoranda, more especially his maps, he is disposed to commit himself to a belief in the authenticity and general accuracy of these travels, which seems to be unreserved, or qualified only by immaterial reservations upon minor points of accuracy in detail. With this letter is transmitted the original German text of the Baron's opening chapter, describing briefly his route from Sirinagur across the Indus, together with a reduced map of the country traversed by him. In communicating these important documents to the Society, M. Khanikof has supplied us with the one thing necessary to form a decisive judgment on the authenticity or spuriousness of the Baron's maps and narrative, in so far as the initial portion of his travels is concerned. Every inch of the ground between Sirinagur and the Indus is now accurately known, and has been surveyed in minute detail. The distinguished officers who conducted that survey are now able to pronounce whether the Baron's map and narrative can be held to delineate or represent that country in any conceivable way. Maps of Cashmere, made previous to the official survey, present, it is true, certain discrepancies, and some of their local names disagree, but in this respect the ratio of general agreement is much greater, both in regard of nomenclature and of geographical conformation, than that of disagreement. But the question is not one of comparison between the Baron's map and those of Jacquemont, Moorcroft, and Vigne, or of these last with one another. The question is, whether the Baron's map represents Cashmere at all; and the officers of the Cashmerian survey have the right of determining this point, by means of their own knowledge, in whatever way they may choose to apply it, without any appeal lying from their decision. All we have to do is to enquire of them whether, for instance, there is a town, Marimati, forming the first stage n.w. out of Sirinagur, or a town Britanis, on the second day's journey, with a hill, Astinaghur, near it, and so on.

Tried by Vigne's map, however, the Baron's case completely breaks down. There is literally not one geographical feature common to the two, nor one local name, unless we identify the Baron's Ushkur with Vigne's Wusikura. The omission of the great Wulur Lake, which the Baron must of necessity have passed, had he gone north-west; of the deep, almost impassable gorge of the Kishengunge, equally unavoidable had he tried an alternative road; and of the great Astore or Hasora valley, which he must have followed had he kept to the main road by Guregs, is wholly inconceivable, and, in fact,

would have been impossible, on the supposition that he really went this way. M. Khanikof suggests that he may have taken a side valley, in order to reach the point where, according to the Russian hypothesis, he crossed the Indus. But no such side valley exists; and Cashmerian geography cannot be accommodated to the Baron. The Baron has to be convicted by the evidence of Cashmerian geography.

Great stress is laid upon the philological tact and discriminative linguistic power of the Baron in assigning the significant local names of so many different regions, each to its own proper area; and this is held to have been a feat quite impossible of performance at the time the Baron is said to have lived, even by the greatest masters of Oriental experience or erudition. But where is the evidence of this alleged tact, within our special domain of knowledge and range of enquiry? There is nothing of the sort. One word alone can be identified as bearing a translation of ascertained correctness, and that is placed 200 miles out of its proper area. *Imra*, or *Imrai*, is certainly the Siyâh-Pûsh or Kafir word for God. But it is put in the mouth of people who speak the Bili, which, by hypothesis, is the Balti, or Little Tibetan—a language now fully known. Granting this, if “Bili,” how can it be Kafir? A Kafir word has no business in a place one day’s journey from the Indus only. M. Khanikof, objecting to Sir Henry Rawlinson’s assertion to this effect, has quoted a note from the late Professor Wilson’s edition of ‘Moorcroft,’ to the effect that the Dardu tribes on the Indus, though of late nominally Mussulmans, are doubtless the Kafirs of Mahometan writers. This note is quoted as decisive of the question, and Sir Henry’s own recognition elsewhere of Professor Wilson’s high character as a cautious critic is triumphantly turned against him. It may be said, parenthetically, and it is hoped without presumption, that general appeals to character are neither here nor there in enquiries of this kind, when used without limitation. All the cautious criticism, and all the Sanskrit erudition in the world, did not prevent Professor Wilson from at least sanctioning in Moorcroft’s list of the *pergunnahs* or administrative subdivisions of Cashmere, the insertion of two districts respectively named Upper Sair ul Mawaza and Lower Sair ul Mawaza, with the capital of each assigned to it. Now these words are merely Arabic for “other places,” “*alia loca*,” and were evidently taken untranslated out of some official Mahometan list. The greatest of critics and scholars, on his own ground, may become as the least when off it; and that condition should be attached to all general appeals made to a man’s character for special purposes. To return to the immediate point at issue, it is clear that when Sir Henry used the word Kafir, he did so in the narrow and distinctive sense of Siyâh-Pûsh Kafir. When Professor Wilson used it he assigned no special meaning to it beyond its usual negative sense among Mahometans, signifying either non-Mussulmans generally, or the particular non-Mussulmans with whom the speaker or writer happens to be in nearest contact. To quote this latter use for the confutation of a statement founded on the former use of the word, is either unfair towards Sir Henry Rawlinson, or implies ignorance of the current value of the word according to Mahometan usage. It need hardly be said that either alternative is out of the question in the case of M. Khanikof. Yet, as the argument stands, the dilemma must stand likewise; and the only way out of it seems to be to assume that M. Khanikof really sees no reason why Kafirs of Kafirstan should not be met with on the Indus. But, then, if such be the case, it is evident that he must be entirely unacquainted with the results of research in these parts. The eastern limit of the Kafirs of Kafirstan is known with almost absolute certainty from coincident knowledge obtained from separate points of observation; and the ethnological distribution of the tribes occupying the whole area between Pamir and the Indus, as determined by language, can now be laid down with fairly accurate, even though rudi-

mentary, outlines. The most recent authorities on the subject are General Cunningham's valuable monograph on Ladakh, Captain Montgomerie's Memoir in the Bengal Asiatic Journal of 1861, and a series of full and very interesting papers on Kafirstan and Chitral, compiled from special native researches by Captain Raverty, and published in the same periodical. In the presence of the mass of information contained in these papers, it is impossible to consider these countries as any longer open to free unlimited speculation.

Similarly, Sir Henry is considered to show remissness in not having at once detected the identity, actual or possible, of the Baron's *Dshashgur Gobi* with the Dard tribes, Strabo's Daradæ and the Daradas of the ancient Indians. The Baron's people, however, are speakers of Bili, which is Little Tibetan, according to M. Khanikof's hypothesis. If such be the case, how can they be Dard at the same time? But they are called upon to be three different things at once, as though two were not enough; for they call God Imra, which is taken elsewhere to prove that they are Kafirs of Kafirstan. Now, clearly, we cannot accept the vindication of any single assertion of the Baron's, made by picturing its component details out of three or four distinct and discrepant quarters at once, and then combining them wherever anything superficially favourable can be pressed into the service, as any substantiation whatever of his authenticity. Yet it is in this very same manner that M. Khanikof appeals to Wyld's map in support of the name of the Baron's alleged volcano, and to a passage in Moorcroft in support of its volcanic character. But the former is s.w. of Sirinagur, and the latter refers to a hill overhanging the Wulur lake, on the north-western road. It is clear that the Baron's volcano cannot be both at once. Nor, for that matter, do the statements coincide in other respects. The Baron is told that smoke and stones are almost always seen issuing from his hill. Moorcroft is told that unaccountable explosions are heard at intervals from his hill, without a word about smoke or stones. Their two reports, each resting on hearsay, do not lie parallel to each other; one treats of a thing always visible, the other of something now and then audible, with nothing visible to account for it.

With the authenticity of the Baron's travels north of Pamir, in Turkistan, we have no occasion to occupy ourselves. The apparent authenticity of his statements when in that region, vouched for by the Russians, who now have the means of obtaining the best possible information on the subject, as well as by the manifest correctness of his local and proper names when in the Turkish countries, undoubtedly serves to complicate the case as regards the Baron personally, but that is no concern of ours. Had we no knowledge of the country south of Pamir, his ascertained accuracy, when on ground north of it, might have been admitted as a plea *à priori* in favour of his absolute authenticity there and everywhere. But this cannot invalidate arguments based on positive data. Yet with the exception of this one general argument, of which the special application is inadmissible, no substantial reason in favour of the Baron has been adduced; nor has any ground been taken up in M. Khanikof's vindication of the earlier part of the Baron's travels, which seems to be tenable for one moment.

2. Recent Volcanic Eruption at Santorin.

[The two following papers may serve as a continuation and completion of the history of the recent volcanic outbreak, the early events of which were described in the account written by Dr. Schmidt, and published in the present volume of the 'Proceedings,' p. 118.]

(a). *Visit of H.M.S. 'Racer' to Santorin.* By Commander LINDESAY BRINE, R.N., F.R.G.S.

"The *Racer* left Athens on the 26th February, and at daybreak on the 27th, after passing Milo, the heavy white clouds sweeping over Santorin were re-

ported in sight. As we neared the island the sea became of an unusually light green colour, the same tint as generally denotes shoal water. This colour was so peculiarly light and muddy that we stopped and sounded, but found no reason to suppose there was any change in the depth given in the chart.

"On entering the Bay we passed to leeward of the Kaimenes, and the light northerly wind then blowing swept clouds of light vapour amongst the rigging and mastheads, the air too was warm and oppressive and strongly impregnated with sulphur. The water in many places was greatly discoloured, but it was observable that this discoloration was never in patches but always in well defined streaks, about 50 yards wide and from 2 to 3 miles long. In the afternoon, after having communicated with the authorities at Thera, we proceeded to our anchorage on the 7-fathom shoal, about half a mile from the volcano.

"Upon examining the extent and nature of the volcano at Neo Kaimene, and also the lately formed island Aphroessa (so called after the name of the Greek gun-vessel), we found that the former consisted of an irregular mass of clinker, scorïæ, pumice, and more or less burnt basaltic lava, raised from 70 to 130 feet above the sea. It had completely filled up Volcano Bay, and occupied the space included within a straight line drawn from Point Phlego to Point Megalo, on the south side of Neo Kaimene.

"Aphroessa had attained to a height of 30 feet, upon a circular base of 300 yards, and consisted of a loose heap of clinker, and some burnt lava through whose crevices could be seen the deep red glow of the burning rocks inside the cone.

"During the day the quantities of steam that escaped, and the loudness of the subterranean noises gradually increased, but unattended with any explosion. At 6:30 P.M., 8:0, 9:0, and 10:30, there were slight eruptions, and at 11:30, there was a loud sharp report followed by three rapidly successive columns of dark smoke or steam and dust—with these columns were mixed volcanic stones, which were thrown to a height of 150 to 200 feet. After this the crater was quiet, but the volcanic action within became tremendous; the cone and adjoining ridges were pressed upwards, about 30 feet above their usual height, and a crashing noise, like heavy waves advancing and receding upon loose shingle, became constant. Steam escaped from hundreds of openings, at first with the noise of steam-whistles, and then as if the valves had been lifted it burst out with the roar of thousands of vessels blowing off steam, the cone and the crater at the same time visibly swelling. At 1:40 A.M. occurred a slight eruption, followed by a comparative silence, the ridges still rising and assuming a rounded form. At 24 minutes past 2 an immense column of flame rose quickly from the crater, this was immediately succeeded by dense volumes of dark smoke, and then at 27 minutes past 2 there was a tremendous explosion; the cone was entirely shattered, and masses of burning rock were shot upwards to a height of more than 500 feet, and outwards to a radius of half a mile. Mikro and Neo Kaimene were literally covered with bright white-hot and red-hot stones, and for several minutes their slopes were brilliantly illuminated; as the stones grew cool their brilliancy faded, but it was fully three-quarters of an hour before their glow finally disappeared.

"I subsequently examined several of the rocks that had fallen from this eruption on Mikro Kaimene, at a distance of about 600 yards from the crater, and found them to consist of the usual hard, black, partly burnt lava, all of considerable size, and many of them measuring quite 30 cubic feet. Some of the heaviest blocks—those that were the least burnt—I estimated to weigh from 25 to 35 cwt., others had but little more specific gravity than an equal mass of cinder.

"The concussion caused by the eruption was very great—it shook the ship violently, and awoke all the men sleeping in their hammocks below—the temperature of the air at the anchorage was also sensibly increased.

"After this great effort the volcano resumed its ordinary action, the crashing noise being still incessant but less loud—there were also slight eruptions of scoriæ and ashes, which were entered in the logbook as occurring at 2.50, 3.10, and 3.15. Others also followed at variable intervals during the day.

"On the morning of the 28th, I took a cutter and the dingy, and accompanied by Mr. Spry the master, Dr. Bromlow, and Mr. Reddie (midshipman), proceeded to examine Aphroessa, and the sea and shore around Neo Kaimene. We pulled through the passage inside Mikro Kaimene, and then skirted the sides of Neo Kaimene, sounding at intervals and testing the temperature of the water. There was no change in the passage, nor on the north side of Neo Kaimene; but on approaching St. Giorgio Bay on the south-west side we found the sea much agitated, and of a light milky blue colour. On pulling to the head of the bay close to the shore we saw numerous sulphur-springs, the temperature of the sea about them varying from 130° to 142° Fahr. The smell of sulphuretted hydrogen here became unbearable, and the bottoms of the boats and blades of the oars which were painted white were turned dark-brown.

"Upon landing we found the shore covered with fragments from the late eruption, many of them being still too hot to touch with the hand.

"Leaving St. Giorgio Bay we pulled slowly to Aphroessa, and then across to Paleo Kaimene. Between the bay and Aphroessa, the water was covered with bubbles, and became almost grey white in colour, and close to the island its temperature was 122° Fahr. The wind being fresh from the northward the sulphur steam and flame were blown clear away to the south, and thus I was able to place a boat close alongside to windward without incurring much danger. The growth of Aphroessa had been rapid. At a point where the Admiralty Charts marked 70 fathoms, there were found on the 11th February only 12 fathoms. On the 14th the island appeared, and on the 28th it had become a cone fully 300 yards in circumference at the sea-level, and 30 feet high. We laid on our oars and watched its progress with great interest.

"The pressure from the steam beneath acted almost imperceptibly both upwards and outwards. At the water's edge large blocks of hissing and burning lava and clinker slowly made their appearance—steam escaping from them at every pore. With an iron boat-hook we broke off several pieces as they rose above the sea, specimens of which I subsequently sent to Sir Roderick Murchison.

"It was impossible to calculate correctly what daily addition was thus made to the base of the island; but, judging from what I saw appear in an hour, it might be roughly estimated at 120 feet. The cone was pressed upwards very slowly, but the volcanic action within was intense. There was no roar, as with its neighbour at Neo Kaimene, but there was a constant working noise—sounds of stones crumbling and falling, accompanied with sudden sharp cracks and reports like the independent firing of musketry. Up to this time there had not been any eruption, but through the fissures in the cone it could be seen that the crater or inner rocks were red-hot, and from every possible rent or opening escaped clouds of steam and sulphurous vapour.

"We now took the boats in a straight line across to Paleo Kaimene, to see if there were any changes in the depth of water away from the immediate neighbourhood of the volcanoes. We found no change whatever. There were also no signs of volcanic action at Paleo Kaimene, and the soundings at its little anchorage were unaltered.

"Returning on the same line we found that at 100 yards from Aphroessa there were only 12 fathoms of water instead of 90, and that within 50 yards

the depth was only 7 fathoms. The arming of the lead brought up in both cases volcanic dust and small fragments of ash and clinker.

"It was now past noon, and the boats' crews had to get their dinners, so we proceeded by the shortest way to the ship, going to leeward of the volcanoes, and were consequently enveloped in a suffocating atmosphere of hot air, sulphur, and dust.

"In the afternoon, as the volcano seemed to promise no second such eruption as had happened in the morning, I thought there would be no great risk in ascending the old cone of Neo Kaimene, so that from the top I could look down upon the crater and see clearly into its operations. In this expedition I was accompanied by Lieutenants Palliser and Darwall. The old zigzag path had become obliterated, and we had to clamber straight up the crumbling slopes, a struggle strongly recalling the last hundred yards in the ascent of Vesuvius. Upon reaching the summit we found that the old crater was sensibly sympathising with the new one; great chasms were forming, and the lips or edges had split in several places, the ground was also quite hot. Crossing over to the southern slope, I sat down by the edge of the cone at a spot about 350 feet above the sea, and from which I could command a complete view of the scene of volcanic action, and at the same time the eye could embrace all the southern portion of Santorin, and the sea and distant mountains of Candia.

"Two hundred feet below was an irregular mass of volcanic rocks. The volcano consisted of a plateau, about three-quarters of a mile long from east to west, and about a mile north to south, the surface being covered with large blocks of basalt, burnt lava, and clinker, lying loosely together, the spaces being filled with pumice and ashes. Near the south-east angle of the plateau over the space previously occupied by Vulcan's Bay rose a circular heap of rocks in the shape of a cone, about 60 feet in height, upon a base about 400 yards round. There was no hollow at the top, the opening being closed by rocks resting upon each other. There were, however, large gaps through which was seen the deep red glow within—the same glow was also visible through the apertures near the base, and occasionally, as the cone heaved and swayed, the near rocks on the plateau moved and discharged burning rocks underlying them.

"The struggle between the opposing forces of steam and weight was very wonderful. As the masses composing the cone became compact and settled in their places, so, proportionally, did the striving of the steam to escape become violent. At first there was a continuous roar like the receding and advancing noise of a heavy surf rolling upon a shingle beach. This sound would slowly change into that of steam blowing off through vast numbers of steam-pipes, then this subsided into the singing noise commonly made by an ordinary tea-kettle on the hearth, shortly before the water boils. Then the shrieking sound of locomotive steam-whistles, and then a silent pause, during which the whole cone swayed with a slow motion to the right and to the left, swelling to nearly double its size and height, and throwing out ridges like mountain spurs. At last a broad chasm would appear across the top of the cone, and, with a tremendous roar, tons of rock and ash mixed with smoke and steam would shoot up from the crater to a height of from 50 to 100 feet. This effort over, the ridges slowly subsided, the cone lowered and closed in—and then for a few minutes would follow a comparative silence, after which the struggle would begin again with precisely similar sounds, action, and result. Immediately before an eruption all the adjacent plateau, and even the conical hill upon which I was sitting, shared in the agitation—a slight wavy motion was everywhere apparent, and steam escaped in all directions; especially was this noticeable upon the edges and sea-faces of the plateau, where volumes of steam found

their way out with considerable violence, and were swept away in heavy clouds over the bay.

"High up on the slopes of the old crater of Neo Kaimene, threads of vapour also found a way to escape, thus proving a subterranean connection between the new and old volcanoes.

"It was a fine clear afternoon; and, being placed above the reach of the scoriae thrown out by the eruptions, I could watch with perfect ease and security all the phenomena in progress below. It was interesting to observe how simple and elementary were the forces engaged—forces at work every day in the common boiler or cottage tea-kettle. Steam struggling to find a vent, and when pent in beyond endurance lifting up its weighty cover, and with a wild rush escaping into the open air.

"It was observable that throughout this agitation the fire within never appeared to get more intense, but that the usual red glow remained unchanged, the process of burning the hard black lava in clinker and ash was clearly visible, and I also noticed that after each upheaval of the cone, the outer edges of the stones composing the newly formed ridges were burnt almost to cinder.

"So undulating was the movement of the cone when being pressed upwards that it was impossible to ascertain the absolute change in progress at any one moment, the eye could only detect the increase in size by those mere optical evidences of the cone and its ridges occupying more space. The motion was, in fact, curiously similar to that of a large wave on a land. There was the same undulation, the same almost , and then a similar waver and subsidence.

"This variation in the size of the volcano prior or subsequent to an eruption is probably the reason of the different estimates given by the observers who have calculated its height above the sea.

"Before the formation of the new volcano, there existed at the foot of Neo Kaimene, at the south part of the passage between it and Mikro Kaimene, a flourishing little bathing village, and also a low broad quay, alongside which the schooners could lay and embark pozzolana or discharge their cargoes. All this has been destroyed by the eruption and by the depression of the shore. We found that the quay and bathing-houses had sunk about 3 feet, and that the Greek chapel and houses at the back had been crushed by enormous blocks of hard black lava. The ruin was complete, there was not a single house left standing. There was a fragment of lava lying inside the chapel, having come through the roof, that must have weighed quite two tons, and the distance from the crater was not less than 400 yards—a proof of the greatness of the force exerted by the volcano.

"Before returning to the ship, we explored Mikro Kaimene, principally with the object of looking at its crater, and also to ascertain if there was any fresh water on the island. I knew that the existence of the latter was improbable; but it happened that an old grey horse had been seen straying about, and so there were some doubts upon the subject. However the search was unavailing, and no water was found.

"The slopes of Mikro Kaimene were covered with little red and blue wild flowers, and between the rocks were here and there a few wild fig-trees, of a species that strangely enough finds root and sustenance upon the barren sides of extinct volcanoes—one of these I saw near the top of the old cone at Neo Kaimene, its roots clinging to a confused heap of lava and ashes.

"On the ascent we passed the remains of an unfortunate mule that had been killed by the eruption—hot lava had fallen upon him, and had burnt away his legs and neck.

"We found the crater of Mikro Kaimene to be a bowl about 150 feet deep, and nearly half a mile round, the inner slopes as well as the outer being covered with rocks thrown from its neighbour. The entire extent of Mikro Kaimene

is only five-sixths of a mile round, and therefore it may be considered simply as a small cone containing the usual hollow crater. It being of older formation than Neo Kaimene, its slopes are less barren. Its height above the sea is about 200 feet.

"It was now getting dark, and the service upon which the *Racer* had been sent having been completed, I weighed and proceeded to the south *en route* for Candia. The wind being from the north-west, we again sailed out to leeward of the burning volcanoes, and it being night we witnessed in their full grandeur all the marvellous effects that accompanied their growth. Again the air was hot and full of sulphur, and our sails and deck were illuminated by the red glare from Neo Kaimene; and as we passed Aphroessa the sea round that burning island was covered with green, red, and yellow flames, shooting up like torches, or playing like serpents upon the face of the water. During the night, long after we had left the bay, the reflexion of the flames could be seen high in the sky, and in the morning, although nearing the snowy mountains of Candia, there were clearly visible in the northern horizon the heavy white clouds which hung like a pall over Santorin.

"I have since received news from Santorin dated the 21st March. The people were regaining confidence, and were getting accustomed to their noisy neighbours. The volcanoes were still active, and both were slowly increasing; but the eruptions were slight and unfrequent, and the whole volcanic action was becoming less intense.

"The only danger now dreaded is from earthquakes. During the first week in February, the volcanic chain to which the island belongs was visited by an undulating wave which was felt at Patras, Tripolitza, Nauplia, and Chios, but as yet Santorin has been spared. The system of building the towns upon the edge and face of the cliffs renders Santorin especially liable to danger from earthquakes, as the slightest shock would suffice to detach masses of the pozzolana and pumice, of which the cliffs are composed, and send them and the houses upon them down to the sea, 900 feet below. Part of the town of Merivouli and the houses on Point Skaro were destroyed by the earthquakes which accompanied the formation of Neo Kaimene, in 1707, and within the past ten years a landslip swept away several of the houses at Thera, the capital town of the island."

Since the receipt of the above communication, Commander Brine has written to Mr. Bates, the Assistant-Secretary, as follows:—

"August 7th, 1866.

"I have just received the last report of Dr. D. . . . It appears that the volcanic action is becoming less . . . and gradual elevation of the bottom between the islands Neo and Paleo Kaimene continues. Aphroessa has become joined to the main island, Neo Kaimene, and is in size nearly as large as the first formed volcano, called Georges. The eruptions have been rare and very slight, and since the 15th of June Aphroessa has ceased to show any flame. The most remarkable phenomena now occurring are the formation of small islets near the volcano, and the elevation of the land between Neo and Paleo Kaimene. It has been found by soundings that in some places the bottom has risen six fathoms in twenty-one days.

"Last May the *Gibraltar* visited Santorin, and this part of the bay was carefully surveyed. A copy of this survey was kindly sent to me by Captain Coote, one of our Fellows, and I forward it to you* that it may be seen at a glance the changes that are taking place—the deepest water *now* found between Paleo and Neo Kaimene is 40 fathoms."

* The chart alluded to is deposited in the Map-room Collection.

(b). *Report of M. Fouqué to the Eparch of Santorin, on the recent Volcanic Disturbances.*

[Translated from the French by the Assistant Secretary.]

M. Fouqué, who was sent by the French Academy of Sciences in the spring of the present year, to observe the volcanic phenomena at Santorin, gave the general results of his investigation in the following Report to the Eparch of the island, at the request of that official :—

“You have expressed a desire to ascertain my impressions of the new volcano which has arisen in the harbour of Santorin, and of the dangers which it might cause to the population under your administration. I hasten to give you such information upon the subject as may interest you.

“The eruption which has occurred in the southern part of the island Neo Kaimene is extremely curious in a scientific point of view, but beyond this it contains nothing of great importance. Up to the present time its principal effect has been to augment the island of Neo Kaimene by two points of land some hundreds of yards in length. This enlargement of Neo Kaimene, added to a very slight sinking of the surface in the neighbourhood, is probably—after a short time has elapsed—all that will remain of an eruption which has alarmed the people to an unreasonable extent. The projections of cinders and stones have not been very great, except on one day, the 20th of February last; and although the outpourings of gas and vapour were abundant, I do not think that they were of a nature to cause much damage to the island of Santorin. Altogether, this eruption, compared to those of Vesuvius, and, above all, those of Etna, is almost insignificant; it is merely an eruption in miniature. I do not exaggerate when I say that the eruption of Etna last year was at least one hundred times more intense than the present one of Neo Kaimene; yet the vine-growers who cultivate the declivities of Etna did not for a moment think of leaving their houses. These general considerations will suffice to show you how exaggerated is the fear caused by this volcanic phenomenon in the harbour of Santorin, but I will give you positive proof of this statement.

“1stly, Whatever may be the theory entertained with regard to the causes of these phenomena, there is a general agreement among scientific men as to the fact that an eruption ceases to be alarming, when the crater is widely opened, and the expansive matter imprisoned in it finds its way to the external air. It has been justly observed that volcanoes prevent earthquakes, and for this reason they have been compared to the safety-valves of locomotive engines. A volcano in activity is, therefore, a happy event for a country subject, as Greece is, to shocks of earthquake; and it is worthy of your notice that the last shocks experienced at Patras and at Tripolitza were hardly felt at all throughout the archipelago, that is to say, in the part which is more particularly protected by the proximity of the present eruption. At the southern end of Neo Kaimene there is a deep rent in the ground stretching between the new volcanic points (George and Aphroessa), and these two points themselves are nothing but the most open parts of this great fissure. Molten lava, torrents of aqueous vapour, volatile salts, and an extraordinary quantity of gases of different kinds issue from these vents. The communication between the atmosphere and the depths of the earth is thus perfectly established; and if there is not a regularly formed crater, this is owing solely to the small quantity of the substances thrown out, and to the feebleness of the eruption.

“2ndly, Owing to the progress made during the last ten years in the study of volcanoes, I am enabled to state that the eruption of Neo Kaimene has never shown more than a moderate intensity. In fact, an illustrious *savant*

who occupies at the present moment, to its honour, a chair in the Academy of Sciences at Paris, and whose pupil I am—M. Ch. Ste. Claire Deville—has demonstrated that there exists a constant and certain relationship between the degree of intensity of an eruption and the nature of the gaseous elements which are ejected from the volcanic apertures. I have myself contributed to prove the truth of this remarkable law, and especially to fix its details. Now this law teaches us that in an eruption of maximum intensity, the predominant volatile product is chlorine of sodium, accompanied by others of soda and potassium; in those of the second degree we find that hydrochloric acid, and chlorine of iron predominate; in a third class of eruption hydrosulphuric acid and the salts of ammonia prevail; in the last class of all, we observe nothing but steam, carbonic acid, and combustible gases. It may be said, therefore, that complete eruptions are of four degrees of intensity. When a great eruption—like that of Vesuvius or Etna—follows in its ordinary decreasing march, it passes successively through these four different phases, in proportion as it becomes weaker and weaker; but there are volcanoes of less importance which never present the highest degree of volcanic activity, and whose manifestations do not pass the second or third degrees, or sometimes even the fourth degree of eruptive intensity. These are the less important in proportion as they stop short at a degree of less intensity. We have in this way a sure way of measuring the intensity of an eruption. Now, when we apply these principles to the present eruption of Neo Kaimene, we find that it has never gone beyond the third of these stages. At the time when it caused the greatest apprehensions it produced in notable quantities nothing but hydrosulphuric acid, aqueous vapour, and combustible gases, all of which are products of the third and fourth periods of volcanic activity. It is clear, therefore, on these considerations, that it has never displayed more than a moderate intensity. What I now say, concerning the small importance of this eruption, seems to be in contradiction to certain facts of a disastrous nature which have marked the course of the past month; I ought, therefore, to enter into some explanation on this subject before I conclude.

“On the 20th February, after a terrible detonation, an extraordinary quantity of incandescent fragments was ejected on all sides; a trading-vessel was burnt, the captain was killed by a stone, and the distinguished party of savans sent by the Greek Government to study the phenomena were nearly made victims of their zeal for science.

“Many days before this event, there had been a great tremor; the ground was about to open, and the gases enclosed underneath burst forth from the interior of the earth were probably ready to burst as soon as a breach was effected. Nothing, therefore, could excuse the imprudence of the unfortunate captain in anchoring his vessel between Neo and Mikro Kaimene, almost at the foot of the George volcano, that is to say, at a point where the danger was very threatening. As to the members of the Greek commission, these gentlemen certainly knew the danger to which they were exposed; they faced it, fully aware of the possible consequences, in the desire to study in near proximity the terrible phenomena.

“There is now no danger of a similar kind to fear. The detonations, indeed, are still loud, but the ejections from the volcano present no longer any real peril; my companions and myself have been able to ascend, since the day of our arrival, the 8th of March, both George and Aphroessa many times; we have been able to walk in the midst of the flames which issue around Aphroessa, and to light paper at them; indeed, we have collected the gases which escape from the two eruption apertures without any accident having happened to any of us. The whole field of eruption can now be trodden over with impunity, except the two hollows of George and Aphroessa, where the temperature at present is too elevated.

"Such being the case, you may understand that there can be no inconvenience in vessels of any tonnage approaching and casting anchor on the bank situated on the east of Mikro Kaimene, in the harbour of Santorin. This lies at a distance of about 1200 mètres from the nearest point of eruption. There has never been at this distance any danger whatever to fear, even when the accidents occurred near Neo Kaimene of which I have just spoken. I may add, that the depth and extent of this bank have not at all varied, neither has there been any alteration in the level of the ground at Mikro Kaimene, Paleo Kaimene, or in the whole northern part of Neo Kaimene. There is, therefore, no danger whatever to fear for the trading-vessels which resort to Santorin. As to the inhabitants of Santorin, their terrors are purely imaginary, their island has survived the grand catastrophe which produced the harbour between Santorin, Therasia, and Aspronisi, they may therefore reckon on its stability. Moreover, their island forms what has been called a "cone of elevation;" the Kaimenes, on the contrary, are what are called cones of eruption. Now all the conclusions of geological science tend to show that cones of elevation are, so to speak, invariable, whilst cones of eruption are liable to change in form and magnitude at each new eruption. The Kaimenes might, therefore, rise or sink, become larger or smaller, without the island of Santorin undergoing any change.

"In conclusion, I wish to say a word on another point. Are the emanations from the volcano likely to have any effect on the health of the inhabitants of Santorin? Will they affect the vegetation, and may they not injure the development of the vines on the island? It is impossible for me at the present moment to give a definite answer to these questions, which are the special study of one of my colleagues, M. de Coregna. But if I may judge by what occurs at Vesuvius, Etna, and Stromboli, whose slopes are thickly peopled and covered with vineyards, I should say that these emanations seem to have but a very feeble action on the health of men and plants; indeed, I should not be surprised to see the vine malady disappear from Santorin under the influence of the sulphurous emanations of the volcano.

"I may add, that all the opinions that I have here ventured to state, are shared in by the learned geologist, M. de Verneuil, who has accompanied me, and who has had the kindness to aid me in my work on the eruption of Neo Kaimene."

3. *Notes on the Country at the head of the Gulf of Carpentaria.* By E. W. LAMB, Esq. Chief Commissioner of Crown Lands.

(Communicated by the Governor of Queensland, through the COLONIAL OFFICE.)

THE following paper was written in answer to a request from Sir Roderick Murchison to the Governor of Queensland, for detailed information respecting the progress of settlement in Northern Queensland; especially with reference to the possibility of depasturing sheep with profit so far within the tropics.

"Brisbane, January, 1866.

"It seems like a marvel, as we look back for a few short years and review the position of the territory now forming the colony of Queensland and compare it with its present state. A large portion was unknown, the small belts of country that surrounded the tracks of some of the early explorers on the maps of the continent gave little indication of the resources of the north for stock, beyond surmise which promised years for its realisation. Leichhardt could scarcely have conceived the changes that have followed his

footsteps. Little did that brave and hopeful man think that the shores of the Gulf of Carpentaria, which were no doubt associated in his mind with days of peril and painful labour, would in so short a time resound with the bleating of flocks and the lowing of herds, that townships and homesteads would spring up on the banks of rivers, where the primeval silence and solitude was three years ago broken only by a few wandering tribes of aborigines seeking a meagre subsistence along their course.

"In the year 1861, there was, in that portion of the colony lying north of the 24th parallel of south latitude, the following amount of stock :—

Cattle	..	..	..	..	..	..	..	..	29,236
Sheep	..	..	..	..	..	..	..	..	402,358
Horses	..	..	..	..	..	..	..	..	2,161

In three years, namely, in 1864, these numbers had increased to :—

Cattle	..	..	..	..	..	..	..	..	205,047
Sheep	..	..	..	..	..	..	..	..	1,346,426
Horses	..	..	..	..	..	..	..	..	7,334

A year has now elapsed since this computation was made ; so that, allowing for the annual increase and large quantity of sheep and cattle which have been driven into the Gulf country during that period, by intending settlers, who in accordance with the Pastoral Laws of Queensland are obliged to stock the country before they are in a position to apply for it—and as 4973 square miles have been taken up in that way, and as the lowest amount of stock required to hold the country so acquired would amount to 124,325 sheep, it will not be an over-estimate to assign an increase of 50 per cent. on the numbers now existing, as representing the amount of stock now (in January, 1866), existing in Northern Queensland.

"As to the pastoral district of Burke, to which this paper more immediately refers, I do not believe I am in excess (having as yet only imperfect returns to guide me) in computing the amount of stock therein, in the middle of 1865, as being fully equal to 71,000 sheep and 8000 head of cattle. This is but a comparatively small number when the large extent of territory is taken into consideration ; but their capacity for increase is far beyond that of ordinary flocks, in consequence of their being mainly composed of ewes. It may, therefore, be fairly presumed, that in May of the present year (1866), there will be fully 110,000 sheep, and 12,000 head of horned cattle in the district referred to.

"The district of Burke embraces the entire area of that portion of the Gulf country in the colony of Queensland which is watered by the rivers Albert, Leichhardt, Norman, and Flinders, and comprises the very best country in the extreme northern portion of the territory. It has been officially described as follows in the Queensland 'Government Gazette' :—

"The lands commencing on the sea-coast in the Gulf of Carpentaria, at Point Fitz Maurice, and bounded thence on the north by a line bearing east to the south-western watershed of the Gilbert River ; thence by the range forming said watershed, in a south-easterly direction to the range separating the waters flowing into the Gulf of Carpentaria from other waters ; on the east by aforesaid range, which is also the western watershed of the Burdekin River, in a southerly direction to the range forming the southern watershed of the Flinders River and its tributaries ; thence on the south by said range in a westerly direction to a point where it is intersected by the 21st parallel of south latitude ; thence again on the south by said parallel to the 138° of east longitude, being a portion of the western boundary of the colony of Queensland ; thence on the west by said meridian of longitude northerly to the sea-coast in the Gulf of Carpentaria ; and thence by the shore of said gulf, in an easterly

and northerly direction to Point Fitz Maurice aforesaid, and including the islands adjacent thereto.'

"The general character of the country in the pastoral district of Burke, is such as to render it eminently adapted for stock of all sorts. It consists, for the most part, of extensive black-soil plains and open downs, producing grasses of the best description, amongst which the well-known 'blue' and 'barley' grasses largely abound. The land, for the most part, is elevated, ranging from 1600 at the heads of the rivers, to about 400 to 500 feet above the sea, at a distance of a few miles from the shore. This extended elevation will have the effect of making the climate more extreme than is found on the coast. But this, in itself, will be an advantage, as being more suitable to the constitution of the sheep than the constitution of the sea-shore. (I shall allude to this point to the grasses, there is a variety of herbs which grow exceedingly; amongst which may be enumerated 'salt-bush,' 'native leeks,' 'wild cucumber,' and 'carrots,' owing to the abundance of superior feed and the presumed freedom from drought (which is not generally experienced north of the 19th or 20th parallel of south latitude). I believe sheep will attain considerable size and weight; but this result will, of course, much depend on proper management and due attention in the selection of flocks for breeding. Whilst the present system prevails, of guarding sheep at night, having a shepherd to follow them by day, no marked improvement is likely to be produced for some time to come—particularly as the necessary erections on a run to enable a less artificial system to be pursued require as a rule more capital than the present squatters are in a position to expend, owing principally to the high price of labour in the remote and partially settled districts of the colony. Under the existing system of managing sheep in Northern Queensland, I do not consider that a greater yield of wool than 2 lbs. per sheep can be expected in the Gulf country, though I feel confident that as soon as fencing in the Runs is generally resorted to, in accordance with the common practice now adopted in Tasmania, Victoria, and portions of New South Wales, that a clip of 2½ lbs. and upwards might reasonably be looked for; assuming of course that due attention is paid to the introduction of fresh blood at successive periods by procuring from the South and its colder pasturages suitable rams for the purpose. The principal advantage the sheep-farmer will derive in fencing his run into several inclosures and allowing the sheep to roam at will, will be the superior quality of the wool grown on the sheep, the larger number of sheep the land will be capable of depasturing, and also in affording them the most favourable conditions for lambing; when so much difficulty is usually experienced in providing green feed for the sheep, whilst the lambs are too young to move far. This will be readily understood when it is pointed out that the overcrowding of a large number of sheep into a fold in a warm and perhaps moist climate, must produce an injurious effect ultimately on the sheep, which exhibits itself in the lightness of the wool grown, and also in time on the general constitution; though this latter consequence does not appear so certain. The early morning and the cool of the evening—the very best time for allowing the sheep to feed—is lost to them; they are brought out in a feverish state, in broad sunlight, to graze and make the most of their time during hours when, under a more natural system, they would be found seeking shade and repose.

"The climate of the district of Burke is usually described as being similar to that of the Kennedy District, which embraces almost the same parallels of latitude, but fronts on the eastern seaboard. Fortunately, the published record of one year's observations taken at Port Denison, at the residence of J. G. McDonald, Esq., who was one of the first to drive stock to the banks of the Albert and Gregory rivers, affords a means of instituting a comparison

with information derived from other sources. Appended is an abstract of the mean temperatures for each month, computed by the Government Astronomer of New South Wales. By this table it will be seen that the annual mean temperature is $74^{\circ} 9'$ in latitude 20° s.; but at Port Denison the range of temperature is extremely slight, as is usually the case in tropical climates near the coast. In the interior, from inquiries I have made and the allusions made by Leichhardt in his journal of the overland expedition to Port Essington, the nights are invariably cool; but the heat during mid-day is perhaps slightly in excess of that experienced on the coast. Putting these facts together, there is every reason to believe that the mean annual temperature would remain very much the same in the higher lands of the Gulf country as at Port Denison (*i. e.* 74° Fahrenheit); but that there would be an excess of daily range of temperature in the former over the latter district.

"This climatic condition is so favourable to sheep-farming, and, combined with the rich soil which the Gulf country abounds, ought to produce sheep of large carcass.

"This is a point of great moment to the grazier who is quite alive to the high prices which fat wethers bring at Calcutta, viz., 30s. a head, as I have learnt from good authority. Sheep might be sent to the head of the Gulf of Carpentaria, by screw-steamer, for a distance of some 3500 miles; taking advantage of the intermediate markets (if found desirable) of Batavia and Singapore. Or, even in seasons of drought, such as the southern colonies have lately experienced, a ready market could be found by driving stock across to Rockingham Bay, Cleveland Bay, or Port Denison, and thence shipping to Sydney or Melbourne. Large quantities of stock are now being shipped at Gladstone (Port Curtis) for the southern markets.

"I know of no district in this colony where so much first-class pastoral country exists. From the headwaters of the principal rivers to within a few miles of the coast, the rich plains before alluded to extend without break. When fully occupied, the district will be capable of depasturing three or four millions of sheep, and at least 200,000 horned cattle and horses; and, when fencing is introduced, 50 per cent. additional upon that estimate. The present population in the district is not easily determined, as the stations are somewhat scattered; but in the neighbourhood of the site of the proclaimed township reserve of Burketown on the Albert River, there are already at least one hundred persons, most of whom are male adults, and who intend, for the most part, to bring their families to the district so soon as the township allotments are marked off, and they can erect their dwellings on their own property. As, however, there is a steady increase maintained by the introduction of labour by the settlers generally, and also by the inducement which high wages hold out, I fully expect to see in the course of the next three or four months a population of 300 souls located at the township, destined, no doubt, to be the founders of a great city and mart of commerce. Already many large stores and public houses are being erected by men of capital anxious to be the first in the field to reap so promising a harvest.

"The Government of Queensland have already despatched the well-known explorer Mr. Landsborough, to be the police magistrate of the Burke district. A surveyor and his staff have also started to survey Burketown and other suitable townships. A detachment of native police, under the command of an experienced officer, together with other officers, for the purpose of opening up the port, are also *en route*. On the 1st of April next, a monthly overland mail will be established between Brisbane and Burketown; doubtless in a few months to be followed by a fortnightly contract. And further, I would add, that the electric telegraph will in a very short time be completed, as far as Bowen (Port Denison), and thence pushed on to Cardwell (Rockingham Bay), and from thence a distance of 360 miles to Burketown, the inhabitants of

which may, therefore, ere very long, reasonably expect to be the first town in Queensland to receive the English news through the Indian and Australian telegraph-wire.

MONTHLY MEAN TEMPERATURES at ADELAIDE POINT, PORT DENISON,
QUEENSLAND.

MONTH.	9 A.M.	3 P.M.	9 P.M.
1863.			
December	79.9	82.8	78.3
1864.			
January	80.6	83.8	78.7
February	80.3	83.2	79.9
March	79.6	82.1	78.1
April	74.8	79.9	71.6
May	69.9	75.2	70.2
June	61.8	70.2	64.9
July	61.9	68.7	62.5
August	66.0	72.3	67.2
September	70.9	75.7	68.1
October	78.7	81.4	77.4
November	79.2	82.4	78.6
Mean	73.6	78.1	73.2

4. *On vast Losses of Land on the Westerly Coasts of France within the historical period.* By R. A. PEACOCK, Esq., Jersey.

Mr. PEACOCK has forwarded a memoir to the Society, giving an account of his researches in the various ancient records of great losses of land by inroads of the sea in the Channel Islands, and on the opposite coast of France. He has arrived at the conclusion that these phenomena are due to successive sinkings of the land which have taken place between the middle of the second and the middle of the fifteenth centuries. The following extracts from the memoir contain some of the principal facts which he has accumulated:—

Losses of Land in St. Ouen's Bay, Jersey.—An ancient MS. is alleged to state that, in the year 1357, the sea engulfed a very rich district of land in the parish of St. Ouen, and that the registers of the Exchequer make mention of a people who inhabited this portion of land. The little islet where Elizabeth Castle stands was detached from *terra firma* about the year 687. The following is from a local paper, 'Gazette de l'Ile de Jersey,' 28th April, 1787:—"The trunks and roots of trees which showed themselves last winter by the agitation of the sea in St. Ouen's Bay, and which are still visible, furnish us with a subject of contemplation relating to times very remote. One sees thousands of trees laid one close to another in this bay, from the Corbière to the two banks of sand at some miles from high water." These banks—Rigdon Shoal

and Great Bank—appear on the chart at *two and three miles distant from the coast*. “Amongst these trees one might see some very large; and we are assured that after a storm from certain quarters it happens that it is very difficult for carriages to pass over the sand.” On April 26, 1861, at St. Aubin’s, Jersey, the Rev. G. J. Le Maistre, head master of the Grammar School there, made the following statement, which the present writer took down in writing. He said that 50 or 60 years ago his father, who is now dead, saw a good many stumps and roots of trees, standing apparently *in situ* where they had grown, below low water. They were near L’Étac village, near the north end of St. Ouen’s Bay.

Vice-Admiral White, a resident of Jersey, and who has since died there on July 2, 1865, was formerly Captain Martin White, R.N., and by direction of the Admiralty made a survey about 1822, which he corrected up to 1840; with very numerous soundings of the Channel Islands’ seas. On May, 22, 1860, the Admiral stated to the present writer that “in taking soundings he saw two or three stumps of trees in St. Ouen’s Bay, a little outside of low water. They were fixed on the soil, or sea bottom, near La Pule, or Pinnacle,” *i. e.* a little north of L’Étac.

April 27, 1861, M. le Feuvre, of Le Hogue, St. Peter’s, a native and owner of property in Jersey, personally informed the writer that there are quantities of submerged trees in St. Ouen’s Bay, due west of the pond, which is in the centre of the bay. He has seen two *in situ*, with upright trunks broken off, at two or three feet high. He and the writer went to look for them at low water of an equinoctial spring-tide, but they were covered up, as they often are, by the wind and waves having drifted sand over them.

Stumps of trees found in situ below high water near St. Helier’s, and in St. Aubin’s Bay.—In the newspaper ‘Chronique de Jersey,’ 7th April, 1847, it is said, “The excavations which are now making to lay the foundations of the new north pier, happen to add incontestable proofs in support of the assertion of many historians, that the works on which Elizabeth Castle and the Hermitage are built, formed in ancient times part of the shore; that is to say, that the large space known under the name or the Bay of St. Aubin was covered with earth, and elevated above high water. At five or six feet deep, the workmen found a rich vegetable earth, and a profusion of roots of trees in a perfect state of preservation.”

On May 7, 1865, the present writer found numerous stumps of trees with roots evidently *in situ*, where they would be covered from 15 to 20 feet with water at high tide, on the north-west of the long pier of the new harbour of St. Helier. Several of the trunks were from one to five yards long, and some of the trees when entire had been as thick as a man’s body. I took two specimens to Birmingham, and exhibited them before the geological section of the British Association on September 9, 1865. Mr. Jurat Nicolle says that nuts, as well as stumps and roots of trees, were found in sinking the foundations of the new pier.

To the south-west of the Engineers’ Barracks, which are on the south of St. Helier, is a marine rock called *La Quesnais*. *Quesne* signifying in the ancient language the modern *Chêne*, an oak; and *Quesnais* means a wood of oaks, *i. e.* plural number, as if formerly there had been a forest of oaks there. The *Quesnais* is a full mile seawards from present high water. It is covered at high water. In 1865, Captain Ranwell, R.N., informed the writer that he was at Jersey with his ship in 1812, and there were then to be seen stumps of trees near low-water mark, in the north-west part of St. Aubin’s Bay, near St. Aubin’s Castle. He did not see them, but several of the ship’s company saw them. The highest tides in St. Aubin’s Bay rise 42 feet.

The obsolete French word “grune” signifies *low marshy ground*. The word occurs a good many times on the chart of the Channel Islands’ seas.

The Ecrehou and Dir-ou-illes.—The Ecrehou isles are six English miles north-east from the north-east angle of Jersey. Maitre Isle, the principal islet, is now very small (the rest are mere barren rocks); by measurement, on May 20, 1864, it was found to contain only 2A. 2r. 15r. within high-water mark, of which a part is entirely destitute of soil, there being only 2A. 0r. 34r. cultivable. Its highest point is stated in the late Admiral White's 'Sailing Directions,' 1846, p. 223, to be 36 feet above high water, but it did not appear to the writer to be so much. The islet produces only grass and some luxuriant plants of the *Lavatera arborea*, or Sea Tree-Mallow; there is neither shrub, nor bush, nor any fresh water. Its extreme length and breadth are 188 yards by 100 yards, and it contains parts of two walls which once formed an angle of the ancient chapel. There are a few huts for the use of those who go for a week or two in summer to gather sea-weed and catch lobsters. The whole group of Ecrehou rocks is about three miles from E. to W., and nearly a mile from N. to S. At a little distance W. commences another group of barren rocks called the Dir-ou-illes, occupying a nearly circular space of about two miles diameter. Maitre Isle must necessarily have formed part of a much larger island within the last six centuries, for various reasons. For, though it is now uninhabitable for want of wood and fresh water (which are not to be had at a less distance than six miles), and on account of its smallness, it had once a sufficient number of inhabitants to induce the diocesan to send two monks to celebrate mass daily in the chapel. Because, as the Rev. G. J. le Maistre well observes, at S. Lo, in the archives, is a parchment referring to the tithes to be received from the curé of the "parish" of the Ecrehous, in Jersey. From which he justly infers, that as it was a *parish*, there must necessarily have been *cure of souls*, and consequently *inhabitants*. And there is also another parchment referring to a village and church of Luneville, in the parish of Grouville, at La Roche ("ad Rupem"). It is scarcely necessary to say there is no village or church of Luneville there now.

Only one angle of the chapel of Maitre Isle now remaining, no judgment can be formed of its original extent. The late M. de Jerville, of Valognes,—a learned antiquary, who studied western Normandy for forty years, and copied five or six thousand pages of records of cathedrals, monasteries, chateaus, and hospitals,—gives a copy in Latin of a charter dated 1203, by which Peter de Pratel gives to God, and to the monks of the church of Holy Mary of Val Richer, for the salvation of the soul of John, king of England, who gave him the islands, the isle of Ecrehou in its entirety, to build there a church (*basilicam*) in honour of God and Blessed Mary, so that Divine mysteries may be celebrated there daily, and the abbot and monks are also to possess whatever they shall be able to build up and erect in the said island. This charter M. de Jerville quotes, he says, from 'Gallia Christiana,' and he says it is recorded in the same volume that Gabriel, Abbot of Val Richer, sent two monks in 1337, on Thursday before Palm Sunday, to keep and preside over the chapel of Blessed Mary of Ecrehou. This is the last we hear of the use of this church or chapel. In a book of the King's rents in Jersey, made in 1607, is an account of wheat-rents due for Ecrehou from the heirs of John le Hardy, gent., and others, which corroborates the fact of their having been a priory or chapel in Ecrehou. Thomas Blampied, of Rozel, who rowed the writer to Ecrehou, May 20, 1864, stated that he had seen in 1861 a stump of a tree which he thought stood where it grew, about 300 yards east of the rock called Gros Tête (which is half a mile N.W. of Maitre Isle), about at extreme low water. Joseph Blampied, of the Glory Inn, Rozel, has seen stumps of trees fixed in the gravel about at extreme low water, between Le Viél rock and Le Bèçus; these rocks are somewhat farther N.W. than Gros Tête. There is a ridge of gravel containing

about 12,000 cubic yards among the Ecrehou islets. But neither here nor anywhere else amongst the Channel Islands is there anything approaching to a sufficient amount of gravel to account for the missing territories as having been merely washed away. If the Ecrehous and Dir-ou-illes have been formerly at a considerable elevation, they would have been habitable and worth inhabiting, and may have contained brooks and springs, in other words, fresh water. And we learn from Lecanu's vast historical researches (see his preface) made for his 'Histoire des Evêques de Coutances,' at p. 448, about the Ecrehous, that "Ils ont dû présenter autrefois une étendue bien plus considérable au-dessus des flots."

As the last date is 1337, it appears probable that the Ecrehous and Dir-ou-illes sunk like the rest in 1356, which was less than 20 years after.

Amongst the Channel Islands some of those now too small and rocky to be habitable, have as part of their names *hou* or *ou*, which, according to M. de Jerville, in the Teuton or Danish language means "house." M. Edouard le Hericher, too, in his 'Glossary' (on Germanic origins), says that *hou* is a common affix in . . . as in the sense of habitation, the *house*,—as Néhou, Quettel . . . , Lihou (rock of Granville), Tatihou (isle of). If these things be so, the fact is very significant. For then we have Ecrehou, or the Ecre-houses; Dir-ou-illes, or the House Isles; also, Brecq-hou, near Sereq; Burhou, near Alderney; Jethou, near Herm; and Lihou, west of Guernsey. And we enquire whether these very "Hous," *i.e.* groups of houses, or towns, were not, in fact, the very towns mentioned by Cæsar, Lib. 3, sec. 12, which gave him so much trouble. It is plain there were once plenty of houses, and consequently of inhabitants, in the places named, where there is now scarcely house or inhabitant! F. C. Lukis, Esq., of Guernsey, an accomplished geologist, antiquary, and naturalist, states at p. 525 of 'Duncan's History of Guernsey,' something which would appear to signify that the Isle of Herm must once have been plentifully inhabited. He says that "the quantity of limpet-shells exposed over the surface, or occasionally dug up, shows the vast use of these by the early inhabitants, and in some places they are found at a distance from the cottages, and at a depth of many feet below the soil. Beds of limpet-shells are not unfrequently found in the Isle of Herm, where it is difficult to account for their . . . : may be observed that if there were formerly plenty of *Hous*, or houses, at Jethou, which is near Herm, the "shell-middings" would be accounted for.

Losses of Land on the Norman Coast, on the west and north-west of Coutances.—The Seigneurs of Mont Chaton, near Regneville, possessed at the end of the river which passes by Coutances, for all time, the fishery of that little river as far as Roqui, Ranqué, or Ronquet, a rock well-known, which is now $2\frac{1}{2}$ English miles in the sea. Conformably to their title, they had fished for all time also in the sea as far as that limit; but their administration commenced an action in 1789, founded on this, that their right of fishing could not extend beyond the river. And two months before the Revolution they established before the Parliament of Rouen, 1st, that their title gave them a right of fishing as far as Roqui, the place where the river of Coutances discharged itself into the sea; 2ndly, that since a long time, it is true, the sea had invaded the land bordering on the river, but that that had not destroyed their right of fishing the ancient bed of the river; 3rdly, that otherwise there existed still all along the ancient shores the trunks of willows visible in the water, which thus settled the limit where the right of fishing could be exercised. By these reasons the Seigneur of Chaton won his action, and the Parliament confirmed to him his right of fishing. This decree may be found in the archives of France, in the last volume of decrees of the Parliament of Rouen.*

* 'Tableaux Historiques de Jersey,' par J. P. Ahier, 1852, p. 97.

A few years ago a fisherman dredging for oysters near the oyster boundary, which is about 3 to 4 miles from the west coast of Normandy, brought up the stump of a tree with portions of the roots attached, which was identified as a plane-tree.

In Lecanu's 'Histoire des Evêques de Coutances,' as a preliminary to writing which he made vast researches, he says: "A vast marsh called Chescy (Scissiacum), covered with forests, filled up all the space now occupied by the ocean from the coast of Brittany as far as Cherbourg, or the Val de Saire, widening itself at the side of Chausey and Jersey over a depth now unknown. The dimensions of this marshy ground cannot now be defined, but this is what we know: in the first place we have assured ourselves that from S. Pair (about two miles south of Granville) to Cape la Hague there exist very numerous stumps of trees rooted in the clay of the shore."

Considering the distance to which the Banc du Viellet (formerly land probably) extends towards Normandy, and the distance westward to which the west coast of Normandy once extended, the statement as to Roqui, and the root found by the oyster dredger in connexion with Lecanu's statement just given, we may consider the interval between Jersey and the Continent to have been in part bridged over.

My friend the late Mr. John Patriarche Ahier, in his 'Tableaux Historiques de Jersey,' gives a map exhibiting a much greater tract of land in the Channel Islands' seas than now exists. All along the west of Normandy the land is shown by M. Ahier as extending farther west, and in particular as extending to and including the Ecrehous and Dir-ou-illes. More land is shown on the west, south, and especially on the south-east of Jersey; and he shows the Minquiers rocks and all the present sea on the south, south-east, and east of them as land. This (supposed) land is represented as being crossed in four various directions by Roman roads; and he states (p. 93) that "the line of the Continent commencing at the Isle of Ushant came by a curve to bear upon (s'appuyer) Guernsey and Alderney, which were only promontories of the Continent, and thence to Cape la Hague. All the isles and rocks which now occupy the sea in the triangle formed by Ushant, la Hague, and Mont S. Michel, were nothing then but elevated points of a considerable portion of the Continent which has disappeared since." The revolution, he says, according to some, has been caused by a volcanic commotion, which produced a sudden sinking of all the countries of about 150 feet. According to others, he says, "It came to pass by reason of an enormous rise of the waters of the globe, coming unexpectedly by the melting of the Polar ice." I agree with M. Ahier so far as this, namely, that there had been sinkings (at about nine different periods), which may have amounted to 100 or 120 feet. And if Abbé Manet's figures are to be relied on, to as much as 176 English feet at Mont St. Michel. I do not think that many others except Mr. Ahier and myself in this locality believed even so much as that. There have been locally several objections made; such of them as are most important will be adverted to in this memoir as opportunity arises.

Losses of Land in the Bay of Mont St. Michel and near St. Malo.—The late Abbé Manet published at St. Malo, in 1829, a small 8vo. volume entitled 'De l'état ancien, &c., du Baie du Mont S. Michel, et de Cancale,' &c. He has undoubtedly rendered great service to science by collecting and narrating, as a historian, a large number of important physical facts. These are here distinguished by the letter M when quoted. He appears to have had no thought as to what may really have been the cause of the sea's overwhelming the forest of Scissey on the occasion of an equinoctial spring-tide propelled by a strong north wind. And especially he assigns no reasons why the water did not ebb off again; nor why that which was the forest of Scissey up to, and into, the year 709, has been a navigable sea ever since.

Some have thought the Abbé has been too credulous. Partly to satisfy himself on that point, but chiefly to obtain what other evidence he could, the present writer devoted a month's hard work at the British Museum, in July and August, 1861, in searching and making extracts. In the southern parts of the Channel Islands' seas there appear to have been sinkings in the 6th century (M.), the 7th century (M.), 709 (M.), 811 (M.), 891 (M.), 1163 (M.), near St. Malo, in 1244; M. Bonissent, a member of the Société Géologique de France, quoting 21st vol. of 'Dom Bouquet's Historians of France,' says a formidable tide inundated our shores anew in 1244, and extended as much as 24 kilomètres (about 15 English miles) over the land, and so completed the destruction which began in 709. The date of the submersion, around at least three sides of Jersey, was, as we have seen, 1356. Of the date of the submersions about Guernsey I have met with no record. Another submersion took place near St. Malo about in 1437 (M.); since which date all appears to have been stationary, except on the west of Brittany, where a sinking is said to have occurred so lately as 1827. (M.)

Of all these that of 709 was by far the greatest. Of the effects of previous "inundations" there is probably no record. Abbé Manet describes the inundation of 709 as having been unhappily sustained by a terrible north wind. It commenced at St. Pair, a small village about 2 English miles south of Granville. "The environs of Ohausey first yielded to its attack, and the tempests continuing to unite their fury to the efforts of the subsequent tides, produced at last the most frightful changes. All disappeared under the waters, with the exception of the mountains which form the islands, and a portion of the forest intermingled with meadows, which was spared for a time on the coast of Avranchin. . . . The storm changed the course of the Couësson and gave to the ocean nearly all the portion of the bay which belongs to Normandy." (M., p. 11.)

It destroyed all the land for a distance of 3 English miles westward of Cape Lihou, near Granville, as well as the land enclosed by an imaginary nearly straight line drawn from the point at 3 miles west of Cape Lihou, to the promontory of Cancalle. But the ravages of the sea, in 709, were not confined to this. It began again, he says, in le Verger, in the commune of Cancalle, and destroyed all the land from le Verger to Cape Frehel, being 21 miles in length and often as much as 2 miles wide. The submerged part first mentioned averages about 18 miles long by 9 miles wide, so that in the whole there was a loss of about 200 square miles, within the districts named. Beyond Cape Frehel he says he has no intention to follow it. (M.)

Not quite the whole of the land in question was destroyed in 709; the isle of Cezembre was still joined to the continent in 1108, and a tract of meadows extending from St. Malo to Cezembre, $2\frac{1}{2}$ miles in length, and called the meadows of Cezembre, was part of it covered by the sea in a moment in 1163.* But the whole of the meadows were not lost till about 1437, which is the date of the last account we have of them.

The sea swallowed up all the flat country in view of the town of Aleth (the cité part of St. Servan). We are certain the disaster there was considerably greater, since this territory was much more populous than the other. Its devastations commenced at Cape Frehel, which *disappeared in a moment*. The assault of the waves *carried away also at the same instant* all the shores occupied by St. Jacut. It made breaches in five or six places in the long chain of rocks which prevailed from the east of Cezembre to the point of Mingar in St. Coulomb (this last place is 4 miles west of the point of Cancalle), and gave passage to the torrent. "At last the lands which joined the two arms of the

* Jan. 1, 1159 (or, as some say, 1161), the town of St. Lo experienced a severe earthquake.

river Rance were overwhelmed in their turn, and the new deluge rapidly gained an entrance to what is now the harbour of St. Malo. It spread itself afterwards on one side into the meadows called la Hoguette and des Jones, which border the high road leading from la Hoguette to Paramé, and on the other side into all that extent which we now call the Marais Rabot, Little and Great Marshes, &c. It extended even to the heights of Paramé, Tertre au Merle, la grand Rivière, and even to Frontu and du Vallion as you go to Chateau-Malo and St. Meloir. The Rance, which was only a large stream from Aleth to Dinan, acquired by the same event a considerable breadth and depth to above St. Suliac, a town about midway between those two places." (M.) The district he describes extends to about 5 miles east of St. Malo, by perhaps half as much in breadth. Do not this remarkable "swallowing up," "disappearing in an instant," &c., signify that the ground had sunk?

The storm changed the course of the river Couësson, which is the boundary between Normandy and Brittany, and gave to the ocean nearly all the portion of the bay which belongs to Normandy. It gained the whole of the following seven parishes, viz.: St. Benoit-des-Ondes, la Fresnaye, and it completely destroyed the land as far as the marshes of Dol, which it inundated in autumn 811. It destroyed the parishes of St. Cherueix, St. Broladre, St. Marcan, Ros-sur-Couësson, and St. . . . (M.) To these M. Ogée adds Tommen or Thomen, 3 . . . le Point. It is now only a rock, but was, until the 14th century, a parish of great extent. The parish of Bourgneuf was not submerged until about the 15th century. The sea uncovers sometimes portions of walls which formed houses. The parishes of St. Louis, Maunay la Peillette, and Paluel, existed until the 12th century. Gifts of property situated in those parishes, made to the Abbey of Vieuxville, attest their existence. The synodal books of the bishopric of Dol bear their names up to 1664. There are also missing the parish of Vivier, the great village of St. Anne, a town called Moulin du Buot, the isle of Herpin, and the port of Winian. (M.)

The sea inundated a tract of land from the Bay of Mont St. Michel nearly to Dol, comprising 26,000 acres, or nearly 40 square miles. The embankment by which it has been recovered was commenced in 1024. (M.)

The lost territory from Chaucey to Dol was covered with a thick and sombre forest—the Forest of Scissey. It was crossed by a Roman road, as shown on the chart. This desert, filled with wild beasts (*præbens altissima latibula ferarum*), was also scantily peopled by certain half savage pagans, and, in Christian ages, by a crowd of anchorites. Another forest extended from the Bay of Verger, which is 4 miles west of Cancalle Point, to Cape Frehel. (M.)

In his note 26, Manet gives references to about eighteen authorities, to prove the fact of the former existence of the forest of Scissey. Some of these the present writer has been enabled to consult, and will quote them presently. Meantime the substance of the Abbé's personal testimony is now given from his note 26.

He mentions "the immense quantity of trees of all species which have been disinterred for ages from the sands of Mont St. Michel, on the coasts of Granville, and especially in the marshes of Dol, &c., where the sea does not impede the workmen. These trees, which are commonly oaks, have preserved their form, their bark, and some of them even their leaves. Their long sojourn in the mud has in the meantime altered their substance a little, and given them, when they are burnt, a sour odour which causes hoarseness, but when the water which has penetrated them is evaporated, their wood, which was soft, becomes compact and acquires great hardness. It takes almost the polish of ebony, which it resembles in colour; and it makes very pretty furniture." It is used for espaliers and in the construction of houses, which are especially seen in the *Isle de Mer*, 1° 51' w. long., 48° 33½' lat., 3½ miles inland.

The inhabitants of the marine islands near St. Malo call these trees "canaillons," the workmen call them "coërons." (M.) The name *Ile de Mer* is significant.

"During the famous hurricane of January 9, 1735, the agitation of the sea was so great on the sandy shore of Mont St. Michel that it ejected from the sand a prodigious quantity of these logs (billes), which were always found lying from north to south; which proves, independently of history, that these trees were not thrown down confusedly here and there, but that the tempest to which they owed their ruin blew from the north." * (M.) *Note*.—This alleged direction of the prostrate trees is not concurred in by other authorities.

"The submarine trees on our shores are covered with about 2 feet of mud, at extreme low water, at St. Suliac and the Bay of Dinard, drawing near the little port, if we may believe M. Brisart, who says he has seen them more than once. In nearly all the other slopes which border the coast on the west these stumps are scarcely deeper. Especially in the bays of Port Blanc, la Garde Guerin, la fosse au Vau, in St. Lunare, and Port Hue, in St. Briac." (M., p. 90.)

The places named the Grande Bruyère and the Cardequint, between Mont-Dol and the Isle-Mer, are especially remarkable for the acorns, beech-mast, hazel-nuts, &c., well preserved, which one encounters at 6, 8, and 10 French feet deep, from which (he thinks) it is natural to conclude that the entire overthrow of the forest of Sciscy in this part was not effected until the approach of autumn. The custom of the borderers, in order to discover the stumps, is to sound the earth with long spits of iron, and to dig in the places where the spits find a resistance. (M.)

"There is a rock called l'Evêque, in the middle of the Bay of Guesclin [west of Cancale Point], which can only be walked on at low water of spring-tides, but which was formerly a strong place. Possibly the little port of Winian was situated there, or near the ancient canal of Guyoul. It is certain that all the old writings up to 1032, when it ceases to be mentioned, agree in saying that this port was not far from Cancavan, which is our modern Cancale. The shoals of Petit Pointu and the environs of Isle Chevrete, and the isles Conchés, Césambre, Harbour and Loubras were well peopled." (M. p. 9.)

Lost Monasteries and Ancient Town.—Probable Amount of Sinking.—Remarks.—Abbé Manet and others give the names and positions of several monasteries, and the former gives also the name of a "Bourg" or town, which were once standing in that part of the forest of Sciscy now overwhelmed by the sea. The monastery of St. Moack's, he says, is five leagues from Dol going towards Chausey, and one league N.W. of the Bourg de Lhan-Kafruth. The writer has therefore placed the Bourg on the great military road, a position which agrees nearly with Manet's description of its situation; the line of the road itself is copied from one of his maps. The monastery is of course placed a league N.W. of the Bourg. At the Bourg there are now about 6 fathoms of water at low water, and at the monastery which falls close to Manet's coastline previous to 709, there are between 7 and 8 fathoms at low water. He says that Rivallon, brother to Judicaël,† King of Bretagne, had in the Bourg one of his hunting-boxes. Violent as he was, in a fit of passion he caused the monastery of St. Moack to be burnt; but afterwards, being penitent, he re-established it in a better state.

* In his foot-note, p. 100, Manet mentions, "l'affreuse nuit du 9 au 10 janvier, 1735," in which the floods surmounted the tops of the embankments, and flooded a vast extent of marsh, to which continual and abundant rains added. The inundation lasted six months in great force.

† Judicaël succeeded Alain le Long, who died A.D. 690.—Morery's 'Dictionary.'

St. Scubilien founded the monastery of Menden 1600 toises (3410 yards) N.N.E. of the Isle of Aaron (on which St. Malo stands), which Manet says must be carefully distinguished from Mandan, which is near Chausey. The sounding at *Menden* at low water is, by M. Beautemps-Beaupré's chart, 24 French feet, equal to $25\frac{1}{2}$ English feet.*

The monastery of Mandan was 6 miles west of St. Pair (a village on the coast 2 miles south of Granville), there are there $5\frac{1}{2}$ fathoms at low water.

The monastery of Taurac or Caurac, was 1700 toises to the east of Cancalle Point, or 2 English miles and 203 yards. At this place there are about 9 fathoms at low water.

Now, supposing the positions of the monasteries and Bourg to have been correctly given, they evidently help to an approximation to the amount of sinking. Because if we assume the Bourg and each monastery to have originally stood (say) 10 feet above high water (they can scarcely have been less), and add to that the rise of tide, and the sounding for each place, the sums will be about the total sinkings. Thus:—

	Sounding.		Above High Water.		Rise of Tide.		Total Sinkings.	
	ft.	in.	ft.	in.	ft.	in.	ft.	in.
Bourg of Lhan-Kafruth	36	0	10	0	54	0	100	0
St. Moack's monastery	45	0	10	0	54	0	109	0
Menden monastery	25	6	10	0	46	0	81	6
Taurac, or Caurac monastery	54	0	10	0	54	0	118	0
Maudan monastery	33	0	10	0	50	0	93	0
Average .. .. .	..	..	..	..	..	..	100	3

M. Edouard le Hericher in his 'Origines Germaniques,' states that "Bourg," under a great number of forms—as Burel, Buret, Buri, Buron, Bur—indicates generally a village *on a hill*, an *elevated habitation*. Thus Lhan-Kafruth may have been on *lofty ground*, which may mean that the sinking was greater than the Table expresses.

But there may be seen on the chart, within the space which appears to have sunk in 709, occasional soundings of 11 fathoms or 66 feet. It will not be correct to take the average, because that would bring the original positions of St. Moack's and Taurac, *below* the level of high water, which cannot have been the case. Ought we not rather to take the maximum, and say the sinking in the Bay of Mont St. Michel has not been less than 118 feet? And may it not have been more than that? For if Abbé Manet can be depended on, the height of the Mont is 176 feet less than it was formerly, and probably only a small part of that is due to alteration (in the height) of buildings.

The Low District Theory at the 'History of Guernsey,' states, and the present writer has confirmed himself of the accuracy of the statement, that peat is dug at very low tides. This peat is justly supposed to have been derived from some catastrophe affecting the coast of the island, as well as the other islands (and the neighbouring coast of France where similar events have occurred) at some unknown date or dates. Whole trunks of trees have been found imbedded in this peat, and there is no doubt this timber grew where it was found. "This district was probably extensive, and enclosed a large portion of Rocquaine Bay, the Hanways or Hanois rocks (a dangerous

* Manet gives in one of his maps a league as 2400 toises; and in Sir John Herschel's 'Outlines of Astronomy,' 1864, p. 716, the toise is stated at 6·394593 British feet. Hence a French league is 5115½ yards. These measures we have adopted.

reef which extends about 2 miles from Pleinmont Point), and the extremity of the island of Lihou. It may have passed beyond the Bays of La Perelle, Vazon, Cobo, the north-western limit of Clos du Valle, including the whole extent of the Braye." The author of the passage just quoted, says also in the 'Archæological Journal,' when speaking of a cromlech at L'Ancrese Bay, on the north of Guernsey, as follows:—"At the period it was constructed, the sea was at a greater distance from the site of the hill than at present, for the whole neighbourhood bears marks of the inroads of that element: the near approach of the sandy hills around it was caused by those events which have so materially changed the coast of these islands, as well as that of the opposite continent."

So far the eminent authority quoted and the present writer are agreed. But it is submitted to the reader that the proposition contained in the following short quotation from the same eminent authority is inadmissible, because it is impossible. He says "that the whole (of the submarine peat and trees) was the produce of a low district which was protected from the power of the Atlantic wave, by rocks and silted materials at a certain distance from the present coast-line."

Now that supposed mass of rocks and silted materials must have been watertight, else the sea-water would have percolated through it, and have made the supposed low district a lake; and if so the trees could not have grown. On the other hand, if the supposed natural embankment was watertight, we are met by another insuperable difficulty derived from the following considerations. Guernsey consists of igneous rocks like the Isle of Bute, where rain gaugings have been taken, and the produce of the streams has been measured all the year round. The result was found to be that a little more than half the annual rain flowed off by the brooks and streams. Applying this fact to Guernsey, where the annual rainfall averages 35 inches, we shall have an annual "flow" of about half a yard in depth. And assuming the most probable situations for the supposed low district and natural embankment of "rocks and silted materials," the latter would have extended along a line parallel to, and at a little distance off the present north-west coast of Guernsey; such line being at present chiefly occupied by rocks. The portion of sea within would have had an average breadth of about half a mile. It would follow then that the total gathering ground comprised between the "water-shed" line, or summit ridge of the hills of Guernsey, and the "natural embankment" would comprise 9,934 acres; and taken at half a yard deep, would yield annually about 24 millions of cubic yards of water. This would fill the assumed low district, taken at half a mile wide, to the average depth of 9 feet 3 inches annually, and of course in a few years have been fatal to the trees; or, rather, it would have been impossible for them ever to have grown there. The Low District theory ought therefore to be abandoned.

Another way of arriving at a similar conclusion, but without quantities, is to remember that there are about half-a-dozen brooks perpetually running day and night into the supposed low district, which would be sure to fill it and kill the trees.

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5. *Further observations on the temperature, Specific Gravity, &c., of the Seas between England and India, supplementary to the Memoir published in the 'Journal of the Royal Geographical Society,' vol. xxxv., p. 147.*

By HENRY TOYNBEE, F.R.A.S., and F.R.G.S., Master Mariner.

BEFORE my leaving England last August, Commander George, R.N., kindly undertook to extract data from the Board of Trade logs with which to form a

chart that should illustrate my paper 'On the Specific Gravity, Temperature and Currents of the Seas passed through during Voyages from England to India,' &c., &c.

I have been deeply interested by Commander George's chart, on which he has expended so much successful labour; it also illustrates very forcibly a fact which I have often remarked, viz., that on the homeward-bound route, just before coming to the eastern edge of the Agulhas Bank, the current is almost invariably easterly, although three or four degrees further to the west, it runs strongly to the s.w., just as if the Agulhas current acted like a wedge and drove the water on its eastern edge in a direction at right angles to its own course.

It would be very interesting to know if the sea in close contact with the land near Natal is warm or cold, whether it belongs to the cold, comparatively still water which exists on the Agulhas Bank, or whether the Mozambique current, with its warm water, skirts along the East Coast of Africa without an intervening cushion of cold water. My impression is that cooler water exists close to the land, at least, near the south-east coast of Africa.

Having the rough copies of the above-named logs, I went into the subject of the temperature of the sea in high southern latitudes more carefully than before; the result of the enquiry is contained in the accompanying chart or diagram,* on which I made the following remarks:—

This chart gives six times as much space to a degree of latitude as to a degree of longitude; by this means a separate line in each degree of latitude is devoted to each of six voyages, the object being to show what temperature was found in the same degree of latitude and longitude each year. The result is striking, for it will be noticed that in nearly the same spot, at the same season of different years, we found water differing 12° in its temperature; for instance, in 40° s. lat., and 23° e. long., in August, 1860, the surface temperature was 67° , whereas in the same place in August, 1863, it was 55° . It does seem as if the cold water were driven under the warm water and forced to the surface in spots here and there. A good self-registering maximum and minimum deep-sea thermometer would give some most interesting results in these parts of the sea.

The style of the chart which I now send distorts the sea most deceptively in the direction of the latitude, but it was the only method I could devise for producing the requisite accuracy. It had been my intention to give a rightly proportioned chart with the mean of temperatures in each degree of longitude in its proper degree of latitude, but this would not show the variations of temperature in the same spot at the same season.

The temperature of warm water is entered in red ink, that of cold water in black, above the temperature is written the current in the last 24 hours, where it was known; and below it the specific gravity. The first five of these voyages enter this part of the sea the latter end of August, the sixth on the 1st of October; they are for the years 1860 to 1865 inclusively. My senior midshipman, Mr. Ridley, has made himself very useful in extracting the data from the logs.

Commencing in 35° s., and 20° w., and sailing to the south-east, we found that the surface water gradually decreased in temperature from 60° to 47° . This cold water is in about 40° s., and extends from the meridian of Greenwich to 14° e. The gravity is from 1.028 to 1.027, decreasing a little as we come to the south-east. The current, especially in 36° and 37° s., from 16° w., to the meridian of Greenwich, is northerly. In October, 1865, for three consecutive days, it was N. 7° w., N. 7° w., and N. 17° e., 16 miles in the 24 hours each day, and the specific gravity was 1.0265.

* This chart may be seen in the Map-Room of the Society, on application to the Curator.—Ed.

In 39° s. and 15° E., we invariably came suddenly upon warm water at a temperature of 60° to 63° , which increased to 67° in 19° E. to 23° E.: the specific gravity was generally 1.027 in the warm water, but only 1.0265 in that at a temperature of 67° . In 38° s. the warm water commenced a little further west, and in 40° s. a little further east. In 41° s. and 42° s. warm water was met with in 50° E. to 60° E., all of these differences showing that the course of the warm water tends to the south-eastward.

From 15° E. to 47° E. the temperature was very variable, seldom below 55° , or above 63° , but it would change from one of these to the other in a distance of 15 miles or less.

In 40° s. and 50° E. we invariably came upon a patch of cold water, sometimes down to 44° , which alternates within a few miles with water 15° warmer. In 40° s. this patch of cold water extends for about 10 or 12 degrees of longitude, and it seems to be surrounded by warm water on all sides, except the south-west.

From 40° s. and 53° E., steering to the north-eastward, we find the surface temperature to be variable; in 39° s. it is from 53° to 59° , still showing the effect of the warm current; in 38° s. it is 55° ; in 37° s. it is from 54° to 56° ; in 36° s. it is from 56° to 57° ; and in 35° s. it is from 55° to 58° . Comparing these temperatures with those to the westward of 15° E., (the spot where the warm water is first experienced), we find that in 39° s. it is from 5° to 9° warmer to the eastward than to the westward; in 38° s. about 2° warmer to the eastward; in 37° s. about the same temperature in both longitudes passed through; in 36° s. about the same temperature; and in 35° s. about 2° colder to the eastward than in the same latitude in 19° W. longitude.

The current from the time we get the warm water is generally a little south of east in direction, and about 20 or 30 miles in 24 hours, it seems to be as strong in the cold as in the hot water; once it was as much as 80 miles in 24 hours. The sea is very high where these hot and cold waters meet; my first experience of it, as commander of a ship, was in 1848, when it jumped our best chronometer out of its stand, and I found it lying on the deck; this first led me to rate chronometers by lunars, which I find is quite feasible to ordinary observers, who may get an error right to 20 seconds, and a daily rate which shall be right to less than one second.

With regard to the warm water, the general impression given is that the great Mozambique or Agulhas current recurves to the south-eastward after running for some distance to the south-west and south, and that its western limit in 39° s. is 15° E. longitude, and its eastern limit in 40° s. is 50° E. Steering, as we do, to the north-east from 40° s. and 56° E., we are not able to follow the route of this current, which most probably continues to travel to the south-eastward, for one can well imagine that this immense body of warm water must have somewhat the same influence on climates to the southward as our Gulf-stream has upon the coasts of Europe. The logs of Australian ships would throw a little more light on this subject, as proved by the quotation from the log of the *Champion of the Seas* in my last paper: unfortunately, the longitude of that ship was not given by Mr. Towson, where he remarks on her having the surface water of the sea 44° in latitude $58^{\circ}30'$ S., and expected ice, *i. e.* nearly 4° warmer than what we had experienced when nearly 1000 miles nearer the equator. I am inclined to think it must have been south-east of the Cape of Good Hope.

In both warm and cold water the specific gravity was about 1.027, slightly decreasing when it was very warm or very cold.

The peculiar way in which the hot and cold waters alternate is very puzzling. I did hope to try some temperatures at various depths, to detect if the warm water were comparatively on the surface, but the deep-sea thermometer broke down, so that this work remains to be done.

On the homeward passage we had the same cold water on soundings to the westward of Cape Agulhas; standing in towards the land near Birkenhead Rock (Danger Point), March 19th, 1866, the surface temperature decreased from 67° to 60° in 20 miles, the last temperature was taken within 5 miles of the land (proving that in some places the thermometer is a useful aid to the navigator in thick weather); the specific gravity here was 1.027, whereas it was only 1.0245 in the Mozambique current where the temperature was 76° . To the eastward and south eastward of the Agulhas bank, this warm water seems to increase its specific gravity very quickly as it travels to the south, for outward-bound in 40° s. it is 1.0265 to 1.027; it is also worthy of remark that in the middle of March we found the specific gravity of this current to be 1.0245, whereas in the middle of February it was 1.0255: this difference is probably due to a month more of the rainy season having existed in the Southern Indian Ocean in March than in February, and it is probable that a corresponding difference exists in 40° s. latitude; here again other logs will be useful.

In Table Bay, March 20th, 1866, the surface was 54° ; about 15 miles north-west from Robben Island it was 58° , and the current running strongly to the northward. In $32^{\circ} 25'$ s., and $15^{\circ} 44'$ e., about 152 miles n.w. by w. (true) from Table Bay the temperature of the surface was 64° , and the specific gravity 1.0262; the sea gradually grew warmer as we increased our distance from the land: it seems as if the bank of soundings brought to the surface cold heavy water from a great depth, as the surface water cools so quickly on approaching the land. Can there be somewhat the same cause to throw up the cold water amongst the warm in higher latitudes? Probably an under current and rough bottom might do something of this kind, causing the sudden changes met with in 40° s.

A remark made at the Geographical Society (I think by Mr. Galton) when the last paper was read, in which that gentleman spoke of the peculiar coldness felt on the coast to the northward of Table Bay, together with what we read of the great dryness of Namaqualand and the Kalihari Desert further to the eastward, led me to put together the facts deduced from my paper printed by our Society, and another printed by the Royal Society 'On the Normal Circulation and Weight of the Atmosphere in the North and South Atlantic,' &c. &c. Our logs show that after passing to the westward of the Cape, and before getting the south-east trades, the wind is almost invariably from west to south-west and the barometer comparatively low.

This south-east wind and lower barometer are most likely due to the rarefaction of the air over the dry and heated lands above mentioned, and the extreme scarcity of rain in these parts may be accounted for by the sea-breeze having to pass over so cold a sea that its capacity for moisture is greatly increased when it comes in contact with these heated lands, so that, instead of giving out rain, it is turned into a dry wind.

Part of this letter seems to be a repetition of my last year's paper; but, having carefully reconsidered these data, I thought it well to lay the result before our Society.

The late Professor Forchhammer's deeply interesting paper, 'On the Composition of Sea-water in the different parts of the Ocean,' alludes to its temperature and specific gravity; having observed them for so many years, I am led to make the following remarks:—

The weight and saltness of the surface water of the ocean in any particular latitude, more especially in the tropics, seem to depend upon the season of the year, and the position of the spot in relation to the cloudy, rainy doldrum which travels north and south, but always exists between the trade winds.

Rough as our method of observing the specific gravity of the sea may be (it is done in a sheltered place in a very full bucket of water) it warns us, when many miles away under blue sky and fine weather, of our approach to these

rainy doldrums, decreasing gradually from 1.026 to 1.022, the cloudy sky which exists over this zone of the sea checks evaporation, which, in addition to the large amount of rain which falls, causes a ridge of higher fresher water in the sea, which runs over to the north and south of the ridge, carrying with it a line of foam, in which we frequently see sickly-looking *Physalidæ* and *Velellæ* which seem to be suffering from the fresher state of the water. Specimens from this surface water would hardly give fair results and (so far as I can remember) the Professor does not allude to these rains, but only to the effects of rivers.

In another place he remarks upon the warm fresh water from the African rivers forming the equatorial current in the Atlantic, whereas we found the temperature of this current to be 69.9° in August, 1863, the sky blue and cloudless, the atmosphere damp and hazy from its contact with this cold water, and its specific gravity was 1.0255, higher than water to the north of it, surely this cold water must have had a Polar origin. Returning home on our last voyage, April, 1866, in the equatorial doldrum between 1° and 5° N. we had a warm current of light water setting to the westward 40 miles in 24 hours, temperature 83° , specific gravity 1.0228; we had much heavy rain with it.

The Gulf of Guinea and Bight of Benin must in some parts be a perfect jumble of heaped-up waters from the meeting of currents, for an easterly current sets into them by Cape Palmas (this we invariably detected as we passed 7° N. outward-bound in August and September), then a northerly current seems to come into them from the southward, and they receive water from the African rivers and from rain: these numerous and abundant sources may well keep up a strong equatorial current.

I have already remarked upon the cold heavy water met with March 19th, 1866, near Danger Point, South Africa: the great specific gravity of this water seems to differ from Professor Forchhammer's experience of Polar currents.

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